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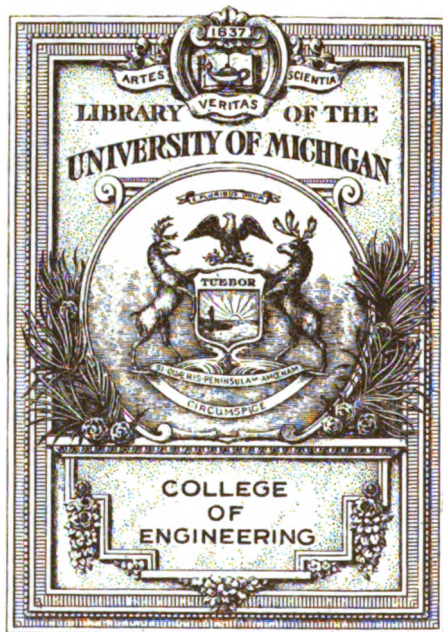
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# Ice Delivery



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# ICE DELIVERY

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A COMPLETE TREATISE ON THE SUBJECT—DEALING  
WITH INEFFICIENCY AND WASTE IN DELIVERY  
METHODS—HOW TO REMEDY THEM—OR-  
GANIZATION—PERSONNEL AND DUTIES  
OF EMPLOYEES — OPERATION —  
COSTS—ACCOUNTING SYSTEMS  
—SERVICE—EQUIPMENT

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BY




PUBLISHERS

NICKERSON & COLLINS CO.,

CHICAGO, ILL.

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**PRESS OF**  
**ICE AND REFRIGERATION,**  
**CHICAGO—NEW YORK**

6-27  
1-18

## PREFACE

The problem of the economical distribution of ice to the consumer is one of the most important to all engaged in the business of selling ice. At every gathering of ice men it is one of the most fruitful topics of discussion. Much has been said and written on the subject, but there has not been the development in this branch of the business that there has been in the production end of it.

One of the main difficulties experienced in making changes in the delivery department of the ice business is the attitude of the men, and the fear of consequences in regard to loss of business if too radical changes are carried into effect. Another reason is that information which would be of assistance to those contemplating changing their methods has not, until now, been available in a form that would enable one to study the problem in a manner that would assist him to judge how best the methods employed by others could be applied to his own particular business.

The distribution of ice to the consumer is more than simply a delivery problem, especially as it relates to the domestic consumer. It is largely a selling and service proposition. The securing of this class of trade is very largely a matter of salesmanship; the retention of it is almost entirely a matter of service.

From the above it might be inferred that "Ice Delivery," therefore, is nothing else but "Selling Ice." There are many things that enter into the sale of ice that have no direct connection whatever with the delivery of it. These subjects are treated in "Selling Ice."

In this book, the first and only one on the subject ever published, the author, a practical ice man of twenty years' experience, from the helpers' job to the management of a large com-

pany, has endeavored to present the subject in such a manner that managers desirous of reorganizing their delivery department will find not only suggested methods to be adopted, but clear and complete details of the application of them.

Another deterrent factor in effecting changes in delivery methods is the lack of men that possess knowledge concerning the essential things that are necessary to perfect an efficient delivery organization. The author, having experienced considerable difficulty in that respect, has endeavored in this work to make of it, to some extent, a text book. In other words, men who are anxious to advance themselves into higher positions can prepare themselves for advancement by the aid of this book.

This book furnishes a complete treatise on the subject of "Ice Delivery," beginning with the causes that make for inefficiency and waste in present delivery methods, and carrying the reader on through Organization, Personnel and Duties of Employees, Operations, Service, Shrinkage, Accounting System for Ice Delivery, Costs, Equipment, etc. Every subject is thoroughly and completely covered; many illustrations, tables and diagrams are used.

In the preparation of this work, the author has made use of many articles pertaining to the subject published in ICE AND REFRIGERATION, and the thanks of the author and publishers are extended to D. F. T. McMahon, N. J. Smith, J. Cruickshank, H. L. Dithmer, Dr. W. B. Craigh, C. E. Wayne, and others whose contributions on the subject have been used wholly or in part.

THE AUTHOR.

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## CHAPTER I.

### INEFFICIENCY AND WASTE IN DELIVERY METHODS.

**Lack of System and Poor Supervision.**—One of the most interesting and at the same time most neglected features of the ice business is the delivery of the product to the consumer. Neglected, because it has not been given the study and investigation that other branches have had; interesting, because it deals with human nature, and offers so large a field for improvements.

Lack of system and poor supervision, if any, in the operation of the delivery department, in a great number of ice companies, is the rule rather than the exception. It is the economical delivery of the product to the consumer that puts the black figures on the profit side of the ledger.

**Economical Operation.**—How can ice be delivered economically?

By having a well organized delivery department, with well-paid, clean and neat appearing men; horses, harness and wagons of the best; proper supervision of the business, through superintendents and foremen held personally responsible for results; men who will take sufficient interest in the business to be ever on the alert for new customers, seek the acquaintance and friendship of the ice consumer, endeavor to anticipate the wants of the customer, and create a feeling among them that their interest is the company's interest.

A company with such an organization will readily gain new

business and retain the old, whereas the unorganized, poorly equipped company will steadily lose its trade and, eventually, fail. It is simply a question of time.

The successful ice companies today are operated according to modern methods. This is especially true in the delivery department where obsolete methods have been discarded.

It is remarkable how quickly a consumer of ice will cease to tolerate the ragged, untidy coarse ice peddler, when he has once experienced good service by clean, intelligent, uniformed men. He will gladly pay the prevailing price for such service in preference to dealing with the other dealer at a lower price.

Companies will spend thousands of dollars in improved machinery and appliances to reduce the cost of production, and if it is decreased four or five cents a ton they are highly elated. But when it is proposed to spend money to increase the efficiency of the delivery department, in which costs can be decreased from twenty-five cents to a dollar or more per ton, they will say there is no use spending money for that purpose, as nothing can be done. For illustration:

**Cause of Inefficiency.**—While discussing this subject with the manager of a company in a town in Massachusetts, a driver passed the window, and the manager said: "There goes a man I am satisfied has \$2.00 of my money in his pocket that he took in on his route today, and what can I do about it? He is a good driver, takes good care of his trade and if I discharge him the trade will suffer. I will have to break in a new man who, in a short time will be just as bad, if not worse, than he is, so I just try to keep the stealing down to as low a figure as possible and say nothing about it."

When told such a condition could be changed, he said, "Yes, I suppose so, but if I attempt to change things they will quit me and take my trade with them."

The president and superintendent of a company in Connecticut, which sold most of its ice for cash, were discussing how to overcome a condition such as mentioned in the preceding paragraph (which they had been discussing periodically for four years), when a representative of a trade association called upon the president. He told the president how it had been overcome

in other places and exhibited some statements to prove what had been accomplished. The president appeared greatly impressed and asked the representative to call again. He did so. Between the time of the first and second call a detective had been employed to check some of the routes. Ten of the routes were checked.

The result of this checking showed 312 less deliveries accounted for than were made. On ten routes these unreported sales were in number as follows: 9, 20, 22, 24, 30, 33, 36, 40, 48, 50. Allowing ten cents for each delivery, which was the minimum piece sold, the loss amounted to \$31.20, or an average of \$3.12 a wagon, and on the 24 wagons which they operated, a total of \$74.40 a day. Taking 100 days as the average season, it amounted to \$7,440. The losses on the other 212 working days would undoubtedly bring this up to \$10,000 for the year.

The loss cited above is not the only loss sustained. Where such a condition exists, the cost of delivery cannot but be high; for, with the drivers so absolutely in control of things, it is logical to believe they do not exert themselves to any great extent, therefore the tonnage per wagon and per man is low, which makes a high delivery cost.

**Dishonesty of Employees.**—How to prevent the driver from making this extra money at the expense of the customer and the company, is one of the most important questions the retail dealer has to contend with.

The prevailing opinion is that it is almost impossible to prevent it or, at least many think that if they are able to hold their men to a reasonable shortage, irrespective of how the customers suffer, to enable the drivers to come within that limit, they had better let it go at that. That view is the wrong one to hold. Probably it is due to that opinion prevailing with so many dealers that the evil has continued to exist and thrive.

**The Loss to the Company.**—It has very often been said that "the company loses nothing," working on the above maxim of "letting it go at that." That is wrong. The company does lose. While the material loss may not be apparent, the moral loss is, and that is something that must be recognized if the ice business is to receive the recognition due it as one of the greatest and most beneficial of all industries, which it is by reason of the



fact that the commodity which it deals in has more to do with ameliorating the general conditions of life than any other. Measures must be taken to force that recognition, and the best method of doing that is for a company to protect the interests of its customers as it protects its own.

If ice companies will stand supinely by and allow their drivers to make more than their wages each day at the expense of their customers they cannot expect, and are not entitled to receive, the recognition due them.

**Responsibility of Company.**—If an ice company offers to sell to a customer so many pounds of ice for so much money, it is morally and lawfully bound to do all that lies within its power to see that the customer receives that number of pounds.

It may be said that it is impossible to cut ice to the exact pound. That is true. While it may be impossible to give the exact number of pounds at each delivery, it is possible for the customer to receive, in the aggregate amount for the week, the number of pounds for which he pays.

It is time the retail dealers should recognize these facts and take action to apply a remedy. The remedy exists—*organization*. Why not apply it and remove that condition which is existent today and has been for years, namely, the fear of what the driver may do if he is held to a too strict accounting of his dealings with the customers of the company?

**Customers of the Company.**—These four words should be very heavily underscored. That is where the relation of the driver in respect to his dealings with the customers comes in. In most cases the driver does not consider that the customers which he obtains belong to the company, but to him individually, and therefore he is responsible to no one for his treatment of them.

The custom of splitting up routes in the early spring and giving part of a route to a new driver to serve and to build up into a large route, is largely responsible for this condition. As it is absolutely necessary that routes shall be so split up each season that is a feature that must be considered in applying a remedy. A man getting a split with from 20 to 40 customers, and who is expected to run that number up to 200 or 250, naturally feels

that as he obtained the additional customers, they belong to him, and not to the company.

In most cases, customers very seldom come in direct contact with the company, and, naturally, consider that they are buying their ice from the driver and not from the company.

It is not good business to devote a great amount of time and money to harvest and manufacture the product at less cost than formerly; to be sure that the quality and appearance are greatly improved and then turn the product over to the delivery men to do with as they please; to make whatever returns they are inclined to; to waste time in serving their route, so as to have an excuse for asking for more help, and explain high shrinkages, all of which the employer pays for. Such a condition makes for poor service, and small, or no profits, and should not be tolerated.

**Opposition of Employees.**—The greatest drawback to the installing of modern methods in any industry is the attitude of the rank and file of the employees to the introduction of anything different from what they have been accustomed to. This condition has a greater or less effect on the employer. A great many would like to adopt the new order of things, but the well-known attitude of their employees make them reluctant to do so.

Effecting savings in the producing end means simply the cost of new machinery or appliances. In effecting savings in the delivery department the human element, labor, enters—reforms among that class of employees who are practically the arbiters of the business—the delivery men. This fact is well-known to both, employer and employee. One takes advantage of it, and the other stands in fear of it. This feature is the prominent factor in retarding progress in the delivery department.

Men who have become accustomed to doing things according to their idea of what is best for their employer's interest, and the great majority of such are the employees of longest service, become unwilling and, in some cases, unable to assimilate new ideas. In the delivery department of the ice business this is particularly so. At least ninety per cent of ice drivers do not desire supervision, for reasons which are apparent to all who have been engaged for any length of time in the business.

From the driver's point of view there is no necessity for any

change. He is doing the best he can and the company has been satisfied in the past with his efforts, therefore why change? To change things means a greater expense to carry such things through and they cannot see where it will pay the company. It is surprising how many drivers are so much concerned about the expense the company will incur in adopting any new system. In one company, in which the delivery department was reorganized, they had drivers that after a period of two months were figuring how the company could expect to get sufficient return under the new system to repay them for the extra expense. Every time their foreman would go with them they would bring that subject up. Finally one of the older men, and the most persistent along that line of talk, was called into the office and the report of a detective who had been employed to check up the routes of the company was read off to him. This report covered ten routes and the loss to the company ran from 90 cents to \$5.00 daily on each route. The total loss to the company amounted to \$31.20 a day. He was told that his route was among those in that list. He was also told a few other things, and from that day on he was never heard to say anything more about the expense; in fact, he became a changed man, and for the better.

In a great number of cases, men having committed themselves with absolute rigidity to the proposition that the new scheme must fail, feel that it is up to them to see that it does fail. This results in a determined and absolutely uncompromising effort to make it fail.

**The Route as an Asset of the Driver.**—In another instance, a driver had been serving a route for seventeen years, and had served his route in such a manner as he believed would make it an asset to him at any time he was placed in a position to need it as such. On the introduction of a new system he immediately condemned it. When the foreman went on his route the first time to write it he made things as unpleasant and perplexing for him as he possibly could. On the first writing the foreman obtained the name or address of 242 customers. After five writings, two of which were on consecutive days, Saturday and Monday, he succeeded in getting 368 names and reported he was satisfied that he did not have a complete list then. He stated that the

man's attitude had not changed from the first day; in fact, the driver had said in conversation, "I'm crooked but you can't get me." The foreman said that, in his opinion, the man was a hopeless case, insofar as ever changing his methods; that sooner or later he would have to be discharged and that it was advisable to let him out then if they were to make any headway, as he knew the other drivers were awaiting the company's action in this particular case to determine as to whether the company was sincere in its intention to carry the new order of things through, regardless of what action the men might take. This foreman, previous to his appointment, had been on very friendly terms with this man, and their wives were quite chummy. This report was submitted on Thursday and on Saturday the driver was discharged.

On Monday the foreman, with a new driver and the old helper, went on the route and at the end of the day there were only two telephone calls from the people who had been missed and the trade was served within ten minutes of the regular time.

The former driver did not get on the route for another company until Wednesday, although he did some canvassing Monday and Tuesday. He tried the strongest competitor first, but they were not in a position to hire him, and another one did, and on Wednesday he appeared on the route and the real test began. At the end of two weeks the route had been reduced to 297, but 14 of those who had quit and gone to the old driver were regained, with promises of others.

The foreman reported that he could not understand why the old driver had not made more of a success in cleaning up the route. People whom he felt positive, from his observations when writing the route, would undoubtedly follow the old driver were still taking from the company and gave no indications of discontinuing. One case in particular, he recalled, was that on the first day he wrote the route, a customer who commented about the company having a man on to watch the driver, as she put it, and from her remarks evidently very much disapproved of it, still continued to take ice; in fact, went out of her way to be pleasant to him.

When asked if he did not believe the reason for this change of attitude was due to the fact that the customer had reasoned

it out that if a company would discharge a driver who had been in its employ for seventeen years, there must have been sufficient cause for it; also that the company in employing men to go on the routes in a supervisory capacity, indicated that the company intended to protect the customer's interests as well as its own, he said that that was about the way he had figured it out.

It is being demonstrated every day that the employee bug-aboo should not deter any company from putting their business on a strictly business basis.

The remedy is an efficient organization and scientific management.

**Studying Operations.**—No company or individual can expect to get the full measure of efficiency out of any department of the business unless the causes that make for inefficiency are carefully studied and when defined, eliminated.

During the past few years a new factor has entered into business. It is termed scientific management. It is a science dealing with facts connected with operations, both mechanical and manual, and is applicable to all lines of business, large and small.

Undoubtedly most men in the ice business are more or less familiar with the results accomplished in other industries by scientific management, but believe that it is only applicable to large industrial establishments using machinery to produce articles of similar design in large quantities. That owing to the peculiar nature of the ice business, with the operating force spread all over a city, and the conditions on each route of such a varying character, it would be utterly impossible to apply any such methods. But is that a fact?

The object of scientific management is to eliminate waste and increase efficiency, thereby increasing production, which means a lower cost per article produced. Waste and inefficiency predominate in the delivery department of most ice companies. Eliminate waste time on routes and it makes possible increased tonnage per wagon and per man, plus increased efficiency of men and equipment, which means—decreased cost per ton delivered, improved service.

In the application of scientific management, the various operations connected with the production of the article made are care-

fully studied; the exact time required in the various operations, and by various employees in performing the same operation are noted. This information is all tabulated with notations. This statistical data is then carefully analyzed and the factors that make for waste determined. From the facts ascertained various changes are made and standards set. A standard is simply the best thing or the best way.

Among those factors that make for waste in manufacture as determined by scientific management, a few that are comparable to the operations of the delivery department are: Defects in methods employed in performing the work; difference in time required to do the same work by different employees; time wasted in lost motion; time lost owing to machines being improperly located, necessitating the worker going after the article to be worked and taking the finished article away; time lost by work in process not following a direct line from raw material to finished article. Now compare these items with operations on various routes.

The superiority of some drivers over others in handling an axe, pick or saw — some wagons will come in with the bottom covered with chips and numerous small pieces; others as clean as a bone. Routes with about the same number of customers, practically the same class of trade, and equal drive, yet one man will finish two hours ahead of another. The unnecessary motions some drivers go through from the time they commence to cut a piece of ice until it is delivered. Residential routes, where the majority of pieces served are similar in shape and weight, drivers waiting until they reach each place before cutting the ice, and while they are doing so the helper standing by waiting. Routes on which the following dialogue and action occurs quite frequently each day. Upon making a stop the driver says to the helper, "I think she wants a ten today; you'd better go in and see." The helper walks in empty-handed, comes out and says, "She wants a ten, Bill," and then stands by while the driver cuts the piece. Another: "She got a piece yesterday, she won't want any today," and upon reaching the station find a telephone call from that party wanting to know why she has not received any ice, and insisting upon having it right away, necessitating a long drive back or a special delivery. Routes on which drivers will



stop delivering in a residential district, drive to the other end of the route, shave up a few tubs for a fish dealer or small soda fountain and then drive back and finish serving the section they left. The tendency of always taking the wagon with them is another time-wasting fault which a great many drivers have. This is best illustrated by the following diagram:

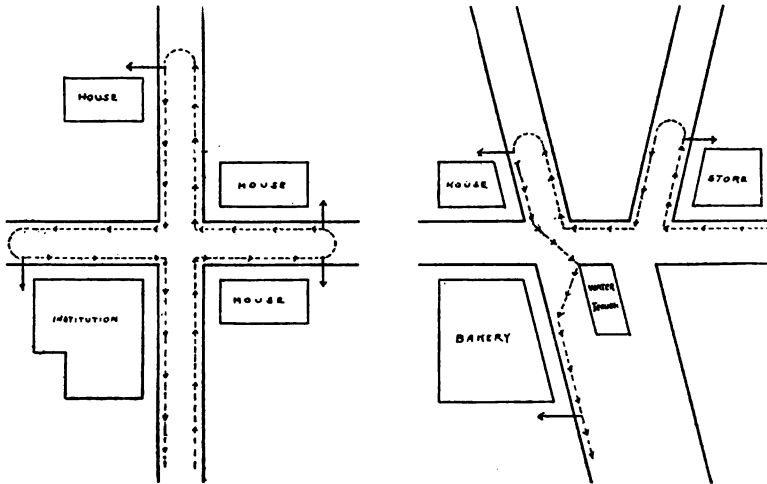


DIAGRAM SHOWING ICE WAGON DRIVER'S CIRCUITOUS ROUTE

In the above diagram the dotted lines indicate the direction of the drive and the arrows indicate stops. The driver of this route had been serving it for seventeen years.

All of the above, and many others, have been observed by the writer in studying route conditions, and no doubt, have been observed by many other men in the business. All of these mean waste, not only in time but also in shrinkage, and last, but not the least, they all make for poor service.

**Insufficient Attention Given to Routing.**—In many companies very little thought and study, apparently, has been given to route conditions. This has resulted in routes irregular in shape; unequal in drive in proportion to customers served; small in territory, yet so congested it is impossible to give the service; routes which overlap each other, etc. By having the boundary lines of the various routes outlined on a city map of fairly good size a far better illustration of this fact will appear than can

be described in an article. It is one thing to know that Route 5 takes in all the territory bounded by certain streets, and quite another to see the boundaries of that route in such form that it is possible to compare it with others, together with the tonnage and number of customers served. Many companies have such maps, but very little real benefit is derived from them, as few men evidently realize the great benefit that can be obtained by a careful study of them.

Improper routing is a prime factor in two essentials—service, and tonnage per wagon per man. For illustration: In a company operating twenty-four route wagons and five 7-ton trucks, handling manufactured and natural ice, with five loading points, in a city of 150,000 population, the highest daily average for a wagon during the month of July was 6.7 tons. There were two such wagons, serving saloons, restaurants, etc., in the central section of the city, each had three men on it; six wagons with less than three tons; five averaging between four and five tons; one five tons; the balance averaged from three to four tons. Each wagon had two regular men, and in most cases an extra man on Saturdays and Mondays. The average for all wagons for the month of July was 3.7 tons. Attention of the superintendent was called to the fact that quite a few of the wagons did not show a big enough average tonnage for one man, let alone two. He replied that on every route there were days in each week when it was impossible for one man to handle it and give the service; there were too many customers and the drive was too big. He was correct as to the drive. As to customers, that was purely an assumption, as at that time the company did not know how many customers it had. Most of the ice was sold for cash, and the drivers were the only ones that knew who and where the family cash customers were located. A driver could lose ten, fifteen or twenty cash customers and the company not know anything of it.

The foreman system was installed by this company, and upon writing the routes some were found to contain from 325 to 370 customers. The foremen also found that on these routes a sufficient number of people had quit, owing to the poor service, to have made two good routes out of the one. A map was used to great advantage in this case. By a careful study of it,

reports from the foremen as to conditions, and suggestions as to changes in the boundary lines of the routes in their districts, the city was re-routed, new routes laid out, single wagons replacing double wagons on quite a few routes. These changes improved the service and decreased the cost.

**Necessity of Organization.**—If scientific principles are to be applied to the operation of the delivery department, the first thing necessary is an organization in which lines of authority and scope of work are definitely defined, and from which there shall be no material deviations. An efficient accounting system, particularly the operating forms for recording the daily transactions of wagon sales, and at least one good daily report, summarizing the entire operations, also a weekly and monthly report.

A good organization makes it possible to handle the business efficiently. An efficient accounting system makes it possible to know accurately what the business is doing, and the facts behind the figures make it possible to detect defects and just where they are, and with a proper organization it is an easy matter to correct them.

## CHAPTER II.

### ORGANIZATION.

**Definition of Organization.**—The Standard dictionary defines organization as “the systematic union of individuals in a body whose officers, agents and members work together for a common end.” The science of organization insists that chains of authority and lines of succession shall be carefully defined. In any plan of organization the distinction between the several units in the system is one of function and not necessarily of individuals. Any scheme of organization can be modified by one individual combining the functions of several.

As the success of an organization depends on a strict observance of the defined lines of authority and close co-operation of the various units, it is absolutely necessary there shall be no overlapping of authority. In the transmission of orders they should follow the regular order as shown in the organization chart. A dissatisfied employe is a liability instead of an asset, and one of the commonest causes of disaffection among employees is conflicting orders.

The term organization in many companies is merely a figure of speech. While they may have some form of organization it is such in name only. No organization, irrespective of how well it is constructed, will run of itself. It takes constant supervision to keep each unit functioning. An organization is composed of individuals, and most individuals will follow the line of least resistance; assuming that everything is operating as it

should. When some glaring irregularity finally awakens them an investigation usually discloses the fact that the entire organization is disrupted.

An organization can only be as strong as its head. If the head becomes slack, the subordinates will also, and so on down the line, and it is simply a matter of time before the entire organization is working individually, without cohesion or discipline.

**Constant Supervision Necessary.**—In order to avoid this condition, the constant supervision and careful analysis of reports is necessary. Laxity, especially in those matters that seem unimportant, should not be allowed, as it leads to carelessness in larger things. The work of superintendents and foremen should be constantly checked. Daily visits and inspection by the Superintendent of Delivery will keep station superintendents on edge.

The use of checkers to write the routes of various foremen, and in checking their writings with those of the foremen, will prevent carelessness and irregularity in the work of the foremen. The rank and file very quickly discover laxity, but when everyone in the organization knows he is being judged solely by his own efforts and his position is dependent on results, he has an incentive to do his best, therefore the organization as a whole cannot be otherwise than successful.

In the volume, *SELLING ICE*, the subject of designating the employees of the delivery department dealing with the consumer as a sales force was taken up, and the organization chart presented the relative positions. As we are dealing with the delivery of the product in this volume the organization chart presented here shows lines of authority, lines of contact, and functions only of those directly or indirectly engaged in the delivery of the product to the consumer.

In presenting this chart of organization (Fig. 1) it is not set forth as an ideal one. It can be modified or enlarged. There will probably be a difference of opinion as to placing the Barn Superintendent under the direct authority of the Superintendent of Delivery. The Superintendent of Delivery is accountable for the operation of the delivery department, and as all the equipment under the authority of the Barn Superintendent is used for this purpose, it should be under his control and the Barn Super-

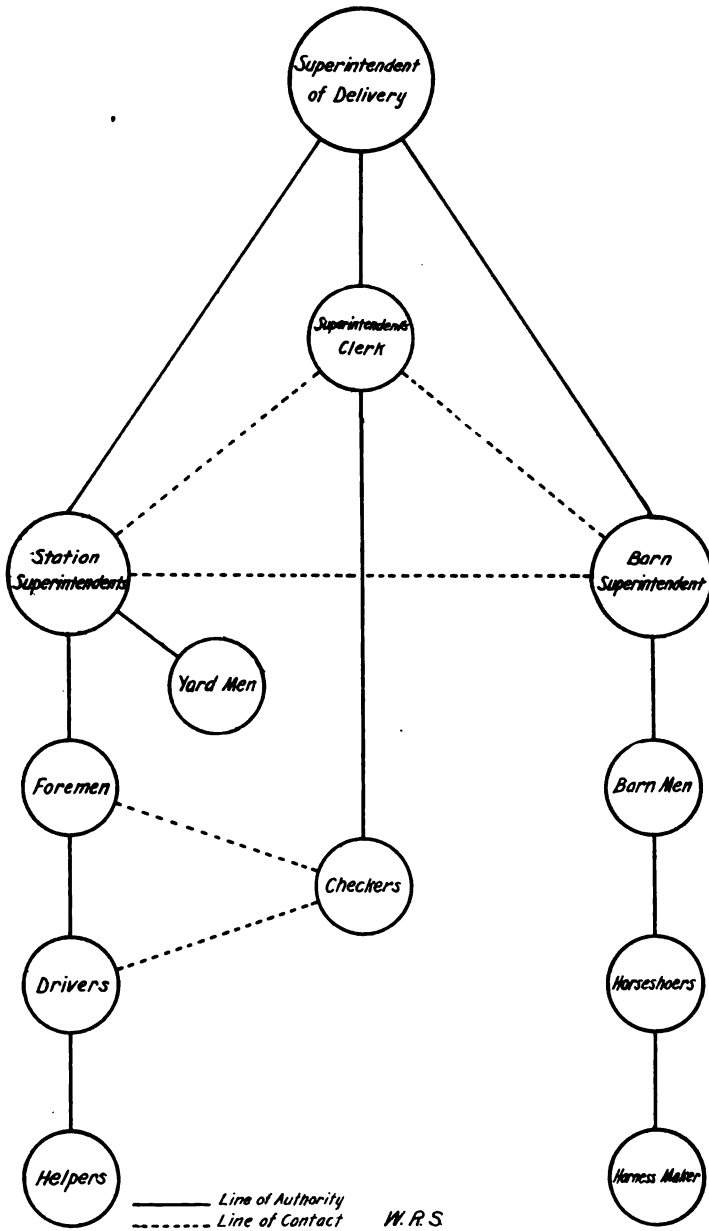


FIG. 1.—CHART OF DELIVERY ORGANIZATION



intendent therefore occupies relatively the same position as a Station Superintendent.

Many men hold the opinion that to have an organization of the character necessary to get results involves an expense that is out of proportion to the returns they will get from it. In this connection it is well to call attention to the chart (Fig. 2), which shows the relative proportion of the various items of cost to the total cost. This chart makes clear a fact which few men evidently realize, that is, the relatively small proportion which proper supervision of routes bears to the total cost. This company has a superintendent in charge of each station and a foreman for each six routes, and the cost is 3.8 per cent of the total cost.

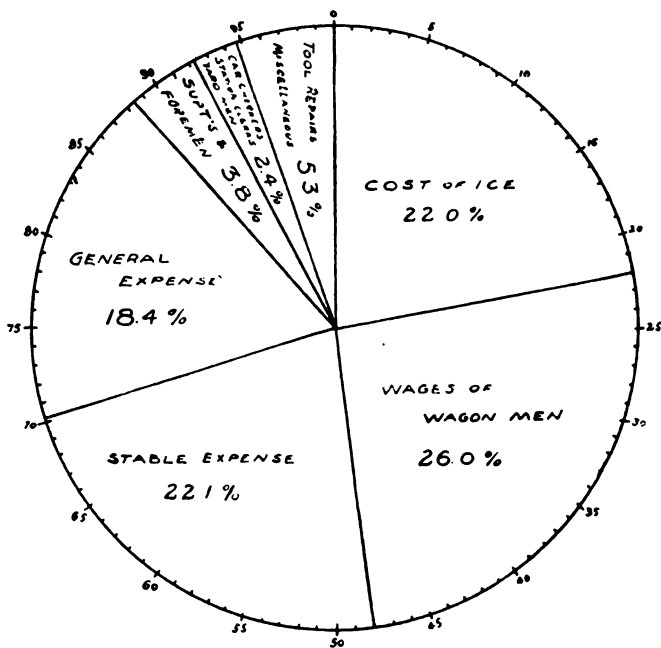


FIG. 2.—CHART SHOWING RELATIVE PROPORTION OF COSTS

As an illustration of the cost and the increase in income as a result of the proper supervision of routes, we will assume a company operates 36 single wagons and has two foremen in charge of them at \$7.00 per day; drivers are paid \$5.00 per day. It will require 40 horses to operate the 36 wagons. With feed

and stable expense of, say, 97 cents a day per horse, the expense will be \$38.80; 36 drivers at \$5.00, \$180.00; a total of \$232.80. Assume these wagons average 2.3 tons per day, or a total of 83.0 tons, this will give an average cost of \$2.805 per ton. Suppose we change to the more efficient plan of having a foreman for each six wagons, which will increase the total cost to \$260.80. As a result of this closer supervision we increase the tonnage per wagon to 2.8 tons, or a total of 101 tons a day, which reduces the cost per ton to \$2.584. With two foremen as above, the cost per ton for foremen's wage is 16.8 cents per ton; with six foremen it is increased to 41.6 cents, a difference of 24.8 cents per ton. Assume that the average price received per ton is \$9.50. On a daily output of 83 tons it would amount to \$788.50; on a daily output of 101 tons it would amount to \$959.50, an increase in income of \$171.00. The only additional expense for this increased revenue is the cost of 18 tons of ice at \$4.00 a ton, \$72.00; and the wages of the four additional foremen, \$28.00; a total of \$100.00, leaving a net gain of \$71.00 daily.

**Necessity of Co-operation Between Departments.**—While an organization is a systematic union of individuals they, in turn, comprise units in the form of departments. Accordingly, the efficiency of each department is a matter of great importance to every owner or manager of a business. This efficiency cannot reach its highest development unless every department co-operates with each other in order to bring about the most economical and successful operation of the organization as a whole.

Each department naturally is concerned chiefly with its own interests. Inter-departmental jealousy and lack of co-operation have destroyed many well planned organizations and made a failure of a business which otherwise would have been a success.

Whatever other methods may be employed to secure departmental co-operation they must always be made effective by the exercise of tact. Department heads must study each other to discern the weak and strong points each possesses and to discover the most approachable side. They must be courteous, patient, open-minded and with a regard for the opinion of others. An executive who does not possess tact is a disorganizer and will do any business more harm than good.

## CHAPTER III.

### PERSONNEL AND DUTIES OF EMPLOYEES.

**Selection of Men Important.**—The success of any organization depends very largely on the personnel of the men comprising it. Owing to the seasonal nature of the ice business it is somewhat more difficult to secure men that possess all of the qualities desired than in most any other business. This applies more particularly to drivers and helpers.

However, if care is exercised in selecting men for the position of superintendent and foremen, and the principles of organization thoroughly ingrained into these men, it will make it easier to gather together a sufficient number of good men as drivers to maintain a skeleton organization throughout the year.

With such a skeleton organization it will not be found so difficult to expand it when necessary, and if the organization is functioning properly, and a spirit of harmony exists, it will be found that new men coming in will quickly fall in line. They cannot do otherwise.

**Superintendent of Delivery.**—The Superintendent of Delivery should of necessity understand the principles of organization and management. He should preferably be a man who has had practical experience in all subordinate positions connected with the delivery of ice, with a working knowledge of figures, as his ability to analyze reports will be a large factor in the successful operation of his department. He should have a liking for details, have a broad vision, possess initiative, judgment and tact ;

be able to command the respect and friendship of all employees without encouraging familiarity; to create loyalty and enthusiasm for the organization and maintain discipline among all.

He should have full and final authority over all employees in his department, exercising his authority through the regular channels as set forth in the organization chart; keep in close personal contact with his superintendents and the operation of their respective stations; devote sufficient time to scrutinizing all reports relating to the operations of his department, so as to take advantage of every opportunity to improve the service and decrease costs by efficient and economical operation of the wagons.

He should have a large map of the entire city showing the district covered by the wagons of each station and the boundary lines of all routes. He shall determine when to put on and take off wagons, consulting with the station superintendents in each case before final action is taken.

All station superintendents are accountable to him for results obtained in their respective districts, and he in turn is solely accountable to the company for the efficient operation of his department. He should earnestly co-operate with the heads of all other departments for the successful operation of the organization as a whole.

**Superintendent's Clerk.**—Care should be exercised in selecting a man for this position. He should be a man of tact and judgment, well versed in figuring costs and preferably a stenographer.

He shall be directly under the authority of the Superintendent of Delivery and shall carry out all instructions and transmit all orders issued by him.

He shall have charge of the distribution of all ice cars used by the company.

He shall check up the daily report of sales, noting any excessive shrinkage; making up a shrinkage report of same for distribution to the station superintendents.

He shall check up time cards and prepare the daily labor report from them (Fig. 3).

He shall prepare the weekly comparative statement (Fig. 4).

He shall keep the employment records of all employees in the delivery department.

## ICE DELIVERY

19

## STATION - DAILY LABOR REPORT

	STATION C			STATION M			STATION N			STATION E			STATION W			STATION S		
	no. of men	no. of women	no. of children	no. of men	no. of women	no. of children	no. of men	no. of women	no. of children	no. of men	no. of women	no. of children	no. of men	no. of women	no. of children			
ROUTER																		
WHOLESALE																		
COAL																		
FOREMEN																		
CHECKERS																		
CAR CHECKERS																		
WEIGHMASTERS																		
BARNMEN																		
ICE HOUSE																		
CASH ICE																		
MISCELLANEOUS																		
TOTAL																		

REMARKS:

WEEKLY COMPARATIVE STATEMENT															
TEMPERATURE MEAN 71.8															
TEMPERATURE MEAN 71.5															
DISTRICT	WEEK ENDING JUNE 30 1917							WEEK ENDING JULY 1 1916							
	CHARGED TONS	DELIVERED TONS	SHRINKAGE TONS	%	MEN	TONS PER MAN	WAGES	CHARGED TONS	DELIVERED TONS	SHRINKAGE TONS	%	MEN	TONS PER MAN	WAGES	WAGE PER TON
C-RTS.	758.6	760.6	2.0		445.4	5.2	438.37	802.6	791.4	11.2	13	170	4.6	513.51	6.5
C-W	599.4	599.4			634	9.4	178.71	674.4	674.4			764	8.8	203.65	3.0
M-RTS.	466.5	454.6	11.9	2.5	264	3.6	385.50	526.8	521.1	5.7	4.7	1634	3.2	487.23	9.3
M-W	323.2	323.2			28	11.2	78.81	311.2	311.2			334	9.3	88.49	3.8
N	203.7	190.1	4.6	2.2	664	3.0	200.52	-	-	-	-	-	-	-	-
E	354.3	341.3	13.0	3.6	1324	2.6	403.97	348.0	328.5	19.5	5.6	138	2.4	415.82	1.37
H	467.4	439.1	28.3	6.0	161	2.7	403.30	511.5	468.6	42.9	8.4	1634	2.8	500.12	1.07
B	646.3	616.3	30.0	4.6	238	2.6	741.55	588.5	524.4	64.1	4.5	176	2.3	723.61	1.33
TOTAL	3819.4	3733.6	85.8	2.2	964	3.8	2922.73	3783.0	3638.6	144.4	4.3	978	3.6	2432.43	8.0

SIGNED

SIGNED \_\_\_\_\_

FIG. 4.—WEEKLY COMPARATIVE STATEMENT

He shall inspect the foremen's daily report cards and make up a foremen's daily report of same.

He shall, in conjunction with the Barn Superintendent, take an inventory of all feed on hand at barns and in warehouse each month, which inventory shall be turned over to the accounting department.

He shall keep a record of all equipment issued to stations, and take an inventory of same on or about the fifteenth of each month.

**Checkers.**—In companies operating a large number of wagons it is advisable to have several men to check up routes, independent of the foreman's writing. Also to help out in writing routes where conditions are such that the foremen are tied up instructing new men or in serving routes.

In employing men as checkers, they should be selected with a view of advancing them to the position of foremen, etc., therefore young, intelligent men who will not be averse to acquiring practical experience by working on a wagon should be selected.

When writing routes checkers will follow the routine as set forth for foremen.

It is the checkers' duties to report irregularities of any character in connection with the service, previous writing, actions of the men, care in handling of teams, report all complaints they receive and make suggestions which in their opinion will be for the betterment of the service.

Checkers should be under the direction and supervision of the Superintendent's Clerk and should report to him direct. They shall make out a daily report, using the foreman's report card for this purpose.

**Station Superintendent.**—A station superintendent should be a man of average education who has made good successively as a driver and foreman. One who has proved his ability as a trade-getter and the possessor of judgment and tact. He should be that type of man who can be popular with his men without permitting undue familiarity and who can create loyalty and enthusiasm for the company among the employees. He should have the company viewpoint and rigidly enforce the rules of the company. He should cultivate the acquaintance of desirable ice

customers and create among them the feeling that they are dealing with the company and not with the employees.

He should drive over a portion of the district each day, observing the work of the route men, calling upon the trade and informing himself as to all matters that will promote the efficiency of the service and the best interests of the company. He should impress upon his subordinates that orders are issued to be carried out, and personally should see that they are.

He is accountable to the Superintendent of Delivery for the management of his station and the results from his district, and shall have authority to employ and discharge any employee under his direct control.

He should keep himself thoroughly informed as to the tonnage and trade conditions on all routes, in order to always have sufficient wagons on to maintain proper service. He should not put on or take off wagons before taking the matter up with the Superintendent of Delivery.

He should supervise the work of his foremen; inspect the route books and report cards in order to inform himself as to the manner in which they are performing their duties. He should carefully inspect all daily time reports, weekly payrolls and all other reports before they leave the station, as after he signs them he becomes responsible as to their correctness.

A good superintendent will be on duty before the first wagon leaves his station in the morning. He will make a tour of inspection upon his arrival, to ascertain personally the condition of the stock and equipment; as to what employees are absent; note the discipline maintained by the foremen during loading, and should not leave the station until all the wagons have left fully manned.

**Foremen.**—To get proper results from foremen there should be one foreman for every five or six route wagons.

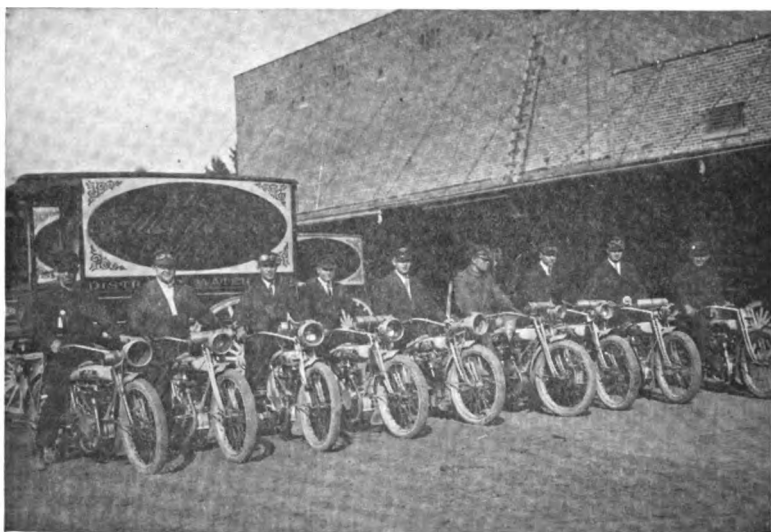
The foreman is the company's representative on the street. It is his duty to protect the interests of the customer as well as the company's, thereby forming a tie that binds the company and customer into a common union of mutual benefit.

The subject of foremen has received a great deal of discussion, and many men claim it is impossible to get men with the



proper qualifications for the position. If the position of foreman is vested with the authority and distinction which it calls for, and wages paid sufficient to make it attractive, men would be willing and anxious to attain the position and give their best efforts to a faithful performance of the duties of the position.

The foreman, preferably, should be selected from the ranks of the wagon drivers for his efficiency and loyalty to the company. In addition, he must possess a higher order of intelligence than the average driver. Attention should be paid, in selecting men for the position, as to their general appearance, sobriety,



GROUP OF FOREMEN WITH THEIR MOTORCYCLES

honesty, reliability and disposition. An ill-mannered, unkempt man, with the odor of drink about him, however great his ability to handle ice, will not make a good route foreman. As a rule, the very best foremen come from that type of men who are straightforward, open countenanced and honest. Such men patiently endure gruelling hardships and as a rule are loyal and true to their employer, honorable and manly with their fellow employees, as well as square with the trade, and are also unlikely to be guilty of unbusinesslike conduct toward competitors.

Foremen should be held responsible for the appearance and equipment of the wagons, the conduct of the men under their supervision and the results obtained in their district. They should be vested with authority to employ and discharge any man under their control. In discharging drivers, unless the offense calls for immediate action, they should take the matter up with the station superintendent. Whatever action is taken should be final.

There should be no interference directly with the men under their control. Any changes or suggestions should be transmitted through the foremen. In this manner only is it possible to hold them responsible for the condition of the routes under their jurisdiction, and get the full benefit of their employment. They should be directly responsible to the station superintendent.

It is the duty of the foreman to have an accurate record in book form of all customers on each of his routes; to see that the customers receive the best of service, correct weight and respectful treatment, and to increase the business of the company in his district. To do this, he must co-operate with, and have the co-operation of his men. In his dealings with his men he should always treat them in such manner as to gain their good will and respect.

He should assist the drivers in securing new customers and encourage them to be courteous and obliging to the trade.

He should write a route daily. When writing routes he should make a personal effort to learn whether the customers are satisfied with the service and conduct of the delivery men. He should note whether the driver handles his part of the work so as to get the best results from the helper, the weight given, and whether the driver is covering his route in such manner as to give the best service. When engaged in such work he should wear his foreman's uniform.

When going with a driver for the purpose of writing his route the foreman should leave the station with the wagon on the first load, and remain with it continually until the driver finishes for the day. As each delivery is made he should enter in his route book (Fig. 15-15A in Chapter VII), the name and address of the customer, how taking (coupon, weight or other manner in which delivery is made), and pounds delivered. When delivery men return to wagon they should hand him the coupons received and he

should enter the number of it in column designated in book opposite name of customer from whom received. At half hour intervals he should enter the time in the column designated and on line where delivery is made. On successive routings, by comparison, it is easy to determine as to the regularity of the service. Reference to the time column in route books will make it an easy matter to locate the wagon at any time. When the foreman is serving the route or breaking a new man in, the time column will keep them informed as to how closely they are maintaining the service given by the regular driver.

Upon completion of the route the foreman should make out his daily report card (Figs. 10 and 10-A, Chapter VII). The forms need no description, except that on the lines under remarks should be entered all information as to the condition and appearance of men, wagon and team, service given and any other information or suggestions which will be of value in determining the capability of the men, improve the service or increase the business.

While conditions are materially improved generally, there are, and probably always will be, men who cannot resist the temptation to make a little extra money at the expense of the customer and company. The manner in which this extra money is made varies considerably. An alert foreman will always be on the watch for indications that will make it possible for him to greatly minimize this evil and eventually stop it entirely.

The writing of the routes by the foremen each week brings about a condition which is as fruitful of results as the pecuniary return from the drivers' customers which he picks up. They become familiar with the route and the manner of serving; with the trade, and many little peculiarities incident thereto; so that when necessary they can go on any route and serve it with satisfaction to all. They can, in a great majority of cases, adjust all complaints, detect places where service can be improved, and by courteous treatment strengthen the bond existing between customer and company.

When foremen are engaged in serving a route they should fill out the card, placing their name in the drivers' line and under remarks give reason for driving. Route book and report card are to be turned in to station clerk each day.



Each foreman should keep the time of all men under his supervision. The ordinary weekly time book can be used for this purpose. From his weekly time book he shall fill out a daily time report (Fig. 5), sign and turn over to the station superintendent daily. At the end of the week he shall make out his weekly payroll from his time book and no entry should be on his payroll that cannot be verified by his time book.

Each week the foremen should make out a weekly report (Fig. 6). The form needs no description. The letters *Cp.*, *C.*, *W.*, *D.* represent the class of trade served: Coupon, Cash, Weight, Drop. Such a report is not only valuable as a record of what each foreman is doing and as to the condition of the routes under his jurisdiction, but is also important for statistical and comparative purposes. The superintendent or manager who has such a report and gives it careful attention will find it of great value.

It should be the duty of the foreman to serve the route in case the driver is dismissed or ill, and to instruct new men. When serving a route the foreman should wear the regulation uniform. In no case should a new man be instructed by a wagon driver, or be permitted to drive a wagon for the first time unless a foreman is with him. If new men are permitted to get their experience from the older men, they are often led astray.

Discipline should be strictly enforced and if it is the rule of the station that all wagons should be on the street by 5:30 a. m. any driver not on hand at that time should lose the day, and the foreman take the route. Under these conditions the foreman will use his best efforts to get good reliable wagon drivers in order to avoid having to drive oftener than absolutely necessary.

Some foremen are so successful in securing and retaining good drivers that it is seldom necessary for them to serve a route. Whereas, the poor foreman is in hot water continually. His men quit on the least provocation, especially on a hot day when the work is hard, or it is often found necessary to discharge some of his men for crooked work on the route, for abusing their horses, and various other causes. This leaves the foreman constantly serving routes instead of supervising his district. When this is of frequent occurrence, such a foreman should be replaced by a better man, who is capable of better control of his drivers, for the reason that when he is serving a route he is only earning

FOREMAN'S WEEKLY STATEMENT																					
STATION		DISTRICT		WEEK ENDING																	
DATE	DRIVER	TOTAL CUSTOMERS			CUSTOMERS SERVED			ICE STATEMENT		NO. OF MEN	REMARKS										
		CP	C	W	D	TOTAL	CP	C	W			D	TOTAL	CHARGED	REPORTED	DIFFERENCE %					
Monday																					
Tuesday																					
Wednesday																					
Thursday																					
Friday																					
Saturday																					
		THIS WEEK		LAST WEEK		THIS WEEK		LAST WEEK													
Routes Written										Total Number of Men											
Routes Served										Average Tonnage Per Man											
Total No Customers (All Routes)										Routes Canvassed											
Average No Customers Per Route										Customers From Canvass											
Customers Gained										Number of Complaints, All Routes											
Customers Lost										" " Investigated											
Customers, Net Gain										Accounts for Collection											
Total No Pounds Reported										Collections Made											
Average No Pounds Per Wagon										Expenses for Week											

Signed \_\_\_\_\_ Foreman

FIG. 6.—FOREMAN'S WEEKLY STATEMENT

drivers' pay and the company is minus the supervision of the particular district that that foreman is employed to look after.

One of the most difficult things to overcome in the making of an efficient foreman is the viewpoint held by most men who have driven an ice wagon. They have a sentimental feeling toward the men whom they have been associated with and will overlook many things which are important from an organization standpoint, but to them are of little importance. Therefore, it is absolutely necessary in training foremen to change their viewpoint from that of an employee to that of an official. To impress upon them that if they are to be successful individually and cooperate with the other officials of the company to make the entire organization a harmonious and successful one, the best interests of the company must be their only consideration at all times; that they are no longer individuals whose personal interests alone are to be considered, but as officials interested in the success of the company as a whole.

For illustration: In reorganizing the delivery department of a company in an eastern city, the foreman system was installed and several of the most experienced men were selected as possible foremen. One of these men when first approached as to the proposition of accepting a position as foreman was somewhat reluctant to take the position. He was a man who was well liked by all the men and took pride in the fact that they believed him to be on the square. He had an idea that if he accepted the position his former companions would consider him a "sneak." After the proposition was thoroughly explained to him and he was assured that everything was open and above board he accepted. At the start the "sneak" idea was still in his mind, but as each day he came in off a route and the day's work was discussed and analyzed he began to change his former opinion, and in two weeks he gave the most valuable information as to the conditions on his routes, and he would say he could not understand it. "To think that he was coming in each night reporting facts about his former boon companions that two weeks previously he would have thought a trick of the worst kind." Three of the original six men in his district lost their positions for the good of the service on his recommendation.

A few suggestions to foremen and others in charge of men:

Nothing undermines respect so much as favoritism. Every man should be treated exactly alike. Every effort should be made to proportion each one's work equally.

A promise broken causes loss of faith. Therefore, make few promises, and those only of the kind that can be fulfilled. Then carry them out.

Hasty or angry words once said cannot be recalled. The recipient seldom forgets them. In order to control others successfully, it is first necessary to be able to control one's self.

Before censuring anyone it is advisable to know all the particulars. When censure is administered for an offense, that should end it. No good can come of constant reference to it. Censure administered in the presence of others is not as effective as when given alone.

The more difficult the job the more satisfaction is felt in successfully accomplishing it. A good man is never beaten. Very few things spread more quickly than discouragement.

Work well done is worthy of praise. Judiciously administered, it is valuable. Work that is poorly performed should be condemned. Foremen or others who always condemn, but never praise, are never successful in handling men.

Foremen should never criticise the management or individuals higher up in the company in the presence of their men. It tends to disorganization. There is a time and place for such criticism.

A cheerful, optimistic foreman will get more and better work out of his men than a sullen, pessimistic one.

Foremen should study their men at every opportunity. No two men are constituted alike; different methods should be used in handling each. In this way only can men be successfully handled.

When a foreman is censured for poor results in his territory, he should not attempt to place all of the blame on his men. By neglect or inattention to properly perform his part he is as culpable as his men. His willingness to acknowledge his part and share of the censure will increase the admiration and respect in which he is held by his men.

A man to be an efficient foreman must essentially be a "company man."



**Selection of Wagon Men.**—Too much care cannot be exercised in the selection of wagon men. They should be men of some intelligence, courteous, cheerful, clean and neat in appearance, honest and prompt. It may be impossible to obtain men possessing all of these qualities, but every effort should be made to obtain those combining as many of the qualities mentioned as possible.

Notwithstanding the fact that the driver is under supervision, if he is the wrong man he can produce more dissatisfaction in three days' work than can be straightened out in three weeks. However good the system may be, it is essential to have reliable men. When hiring men for delivery wagons it is well to impress upon them that there are three things which they are expected to do and which are imperative:

*First.* Give correct weight.

*Second.* Under any and all conditions be courteous and obliging.

*Third.* Give regular and uniform service to all.

By complying with them it costs him nothing, but on the contrary, makes his work easier and more pleasant.

Experience has proven that where one man will serve about 5,000 pounds daily on a residence route, another man can take the same route and increase the sales from 1,000 to 2,000 pounds daily under the same weather conditions. The reason is that the first man tries to see how little he can do without losing his position. A good man will sell more ice and satisfy the customers much better by keeping the refrigerators well filled.

If a driver has been employed for three or four years and has not qualified for promotion to foreman, he should be replaced by a man more ambitious and capable; in fact, it is good policy to employ each year young, capable men, new to the ice business, in order to have competent men to fill vacancies and who can be promoted to the position of foreman and superintendent.

Drivers should be educated to a certain extent regarding the cost of production and delivery of the product they sell, so that when necessary they can talk intelligently upon the subject to customers concerning any so-called large profits made in the ice business. Such information might have an effect on the men themselves in respect to the wage question.

Delivery men should be instructed that when they encounter a customer who is irritable and finds fault without cause, or makes a complaint, they should not further irritate her by replying in an angry or impertinent manner. That is the time to exercise courtesy. If a courteous reply does not appease her, they should simply disregard the remarks. Under no circumstances should they allow it to influence their actions at the next stop.



THE DELIVERYMAN AT WORK—COMMENCING DELIVERY

Drivers should be impressed with the necessity the company is under of making them thoroughly responsible for any damage occasioned by carelessness. All damage of property whether caused by accident or carelessness should be reported immediately for investigation.

**Driver's Duties.**—The principal object of every driver should be to sell ice and satisfy his customer, therefore he should arrange his route so as to make deliveries to the best possible

advantage, consulting with, and following any directions of his route foreman.

Before loading his wagon, a good driver will see that the wagon is thoroughly cleaned, that the ice contains no dirt from the platform or elsewhere, and that it is loaded in such manner as to minimize the possibility of any of the cakes falling out of the wagon.

Delivery of ice on each route should be made as early in the day as possible.

He should leave the station in the morning with his wagon and return with it at completion of the day's work. He should not be permitted to meet his wagon away from the station, or the helper to return with it.

In delivering to coupon customers he should be careful in detaching coupons in order to avoid any suspicion that he has taken more than he should.

He should familiarize himself with the size of the ice chamber of the refrigerators on his route and cut his ice so as to avoid chipping the piece in the house to make it fit. Nothing displeases a good housekeeper more than to have her clean floor all messed up.

Where window cards are used, care should be exercised that none are overlooked. With customers who are at all regular in taking ice it is very much better to make a daily call than to depend upon a window card.

"Safety First" is a good maximum to follow when in doubt as to customers' instructions or needs in hot weather. Play safe by calling on them. *Don't think they have enough to last another day.*

With new customers it is advisable to first see the ice chamber to be filled before making the delivery. If this practice is followed it will be found that many people can be induced to take fifty pounds at a delivery where otherwise they would only take twenty-five pounds. This is of advantage to customer, driver and company.

Drivers should strive to give such satisfactory service that their customers will tell their neighbors about them. They will gain more new trade in this manner than by any other efforts they put forth.

They should keep close watch on all new buildings, residences and flats for new occupants, and endeavor to be the first ice man to call on them, as usually it is the first one that calls that gets the business.

The slogan of every driver should be, "Once a customer, always a customer." Therefore, they should be very prompt in reporting the new address and date they will move into their new home of all customers who intend moving off their route.



THE DELIVERYMAN AT WORK—SHOULDERING ICE

A record should be kept and foremen should see that the drivers of the routes upon which they move call upon them as soon as they move in.

They should immediately report any customer who quits, regardless of the cause. The foreman or superintendent may be able to induce them to continue.

Drivers should be careful about carrying street dirt into the houses of their customers. This can be prevented if they will be careful to stamp most of it off while walking on the pavement, and where possible wipe their feet on a mat.

Drivers should exercise care and precaution in taking out and replacing articles in the ice chamber, also in delivering the ice not to cause damage of any kind, either to articles or refrigerator.

Drivers have to serve all classes and nationalities, but one language is understood by all—the language of politeness. He must sink his sensitiveness and take with a smile all that the customer says, whether justifiably or not; his reputation is at stake for holding trade, and that, a good driver prides himself in.

Drivers will always bear in mind one thing, when a customer complains of anything they will find it to their advantage to listen attentively and respectfully until she has finished; never interrupt the speaker while she is talking.

A good driver will take pride in properly cleaning his horses daily, keeping the harness blackened and the brass polished. Feeding of the horses, except when it is necessary to feed them on the street, is the duty of the barnmen.

Drivers should accommodate their customers in every reasonable way, but they should not lose sight of the fact that they are paid to sell ice and their worth to the company depends on the number of tons of ice they deliver.

Drivers should be held strictly responsible for each and every delivery made, whether by themselves or their helpers.

**Helpers.**—With the more general use of one-horse, one-man wagons, helpers are rapidly becoming a thing of the past. Until the heavy trade can be educated to the point where no delivery will be made exceeding 150 pounds, there will still be need for helpers.

When employing helpers they should be selected as to their capability to make drivers.

The regulations pertaining to drivers in the delivery of ice will apply to helpers.

Helpers should be under the direct authority of the driver, as he is responsible for their actions.

**Prescribed Rules for Delivery Men.**—The following set of rules and regulations used by a large company are very good with the exception of No. 11, and the objection to that is the great loss of time that would be occasioned if that rule was followed.

RULES AND REGULATIONS  
FOR  
ICE DRIVERS AND DELIVERY MEN

No. 1. Call the office before returning to the factory. It may save you a trip back, or may save us the trouble and expense of sending a special to fill an order or two on your route.

No. 2. Allow no one to ride on your wagon unless an employee of this Company. **ESPECIALLY CHILDREN** should not be allowed to ride.

No. 3. Be careful about your team—do not leave them without a weight, or traces unhitched, if there is the least danger of their becoming restless or frightened. Runaways are very dangerous, and if some one should be killed or hurt it would be very distressing. If your team is unsafe to stand, notify me at once, and I will arrange for necessary precautions.

No. 4. We expect our employees to be particular in regard to their personal appearance and neatness at all times. This is as important for your own interest as for that of the Company you represent. Clean shoes help to gain the good will of the housewife who appreciates a clean floor, and personal neatness is a personal asset.

No. 5. Courtesy and politeness to all customers and the public in general is absolutely indispensable, both to yourself and to your company. Indifference, loss of temper, manner and language unbecoming a gentleman cannot be tolerated. You will necessarily come into contact with some unreasonable people, but **REMEMBER** that an even temper and an accommodating manner on your part at all times, will win friends, both for yourself and the Company.

No. 6. Remember "**SAFETY FIRST**"—Be over-careful in driving. Run no risk that might cause injury to fellow workmen, pedestrians, vehicles, bicycles, teams and the general public. **NO FAST DRIVING** is allowed.

No. 7. Treat your horses well and do not abuse them. Remember that the horse is a dumb beast and unable to resent, and deserves nothing but the best treatment. Please report to Manager if you have a vicious or unsafe horse.

No. 8. Be very careful about watering when warm. When driving they should be watered frequently, but never allowed to drink large quantities at a time. Always water before feeding, if possible.

No. 9. See that the ice in your wagons is at all times thoroughly protected and covered by tarpaulins.

No. 10. Weigh your ice before delivering, and when requested to do so, weigh on the customers' scales, and in the customers' presence.

No. 11. Watch for ice call cards, and leave cards with customers or prospective customers who have no cards; but when in doubt, call

at the house to be sure that no one is passed who may want ice. It is better to make a daily call of inquiry than to miss serving a customer, and people frequently forget to place the call card; and you are expected to visit all buildings and residences and solicit the patronage of those who are not taking ice regularly. Your success in building up trade on your route is the measure of your ability as a salesman.

No. 12. In case of accident or injury to the driver, helper, team or any other person, or to any property, the driver must take the names of as many witnesses as possible, and report immediately to the office. Also make report in writing, giving names of witnesses as soon as possible after accident.

No. 13. Drivers must IN ALL CASES report immediately upon return after completion of their delivery routes, and turn in all cash and coupons received during the day.

No. 14. No smoking is permitted in or about the barn, and the barn foreman must enforce this rule when necessary.

#### MANAGER.

**Barn Superintendent.**—The Barn Superintendent should be a man who thoroughly knows horses and the various defects appertaining to them; who has had years of practical experience in the care and handling of horses. It is not necessary to be a veterinarian, but he should be competent to detect ailments and to treat the minor ones. He should be able to read and write. He should be able to judge the grade and quality of all feed, and prepare a properly balanced ration to be fed the stock; possess the ability to select proper men for barn men, arrange the routine and formulate rules for their guidance, and exercise careful supervision of their work. He should be prepared to answer emergency calls at any hour of the day or night. Sobriety and honesty are essential points in selecting a man for this position.

The Barn Superintendent shall have charge of all barns, barn equipment, feed, horses, wagons, harness, etc., and shall be accountable to the Superintendent of Delivery for the care and condition of same.

He shall make out a barn report each month as described in Chapter IX.

All barn employees, horse-shoers and harness makers shall be under his direct authority and supervision and he will be held strictly accountable for their actions while on duty. He shall have power to employ and discharge all men in his department.

He shall purchase, or order the purchase of all feed, and shall be accountable for quality, care and use of same.

All purchases of horses should be made by him, or upon his recommendation.

He shall, in conjunction with the superintendent's clerk, take an inventory each month of all feed on hand.

**Barn Men.**—It is a common custom to take old drivers and place them in charge of the barn. The majority of them know absolutely nothing about horses or their care; have no realization of the responsibility and in most cases are men who cannot get work of any other kind. Yet such men are placed in charge of property representing, even in a small company, thousands of dollars.

Barn men should be selected for their experience in the care of horses; men that can be depended upon to obey the instructions given them. A drinking man should not be employed under any circumstances.

The duties of barn men shall be prescribed by the Barn Superintendent. No orders or instructions should be given them that will conflict with their prescribed duties. Any criticism or objections to their behavior, care, or feeding of the stock in their charge shall be communicated to the Barn Superintendent for his consideration and action.



## CHAPTER IV.

### OPERATION.

**Problem of Pleasing the Public.**—In operating a delivery department we are brought face to face with the problem of pleasing a general public; a problem that has no solution. It is utterly impossible to please everybody, therefore it is necessary that the operations of the delivery department will be such as will bring forth the least number of complaints and produce the greatest number of satisfied customers.

Irrespective of the size of the company it cannot be operated successfully unless it is efficiently managed and has some definite plan of organization. The same principles of organization and management that apply to the operation of a big company apply to the small company. The only difference in organization is that one individual combines several functions.

The ice business does not offer the opportunities of studying the operations of its employees with the same facility and methods as are applicable to most other lines. The operations of employees are more of an individual proposition and the work is not confined to one place, but is spread over a space of a mile or more in extent, and is of a variable nature. The various classes of trade served, the difference in conditions at each place served, the fluctuating demand for the product and the varying quantity desired by a large percentage of the customers on each route, tend to make it a difficult matter to obtain data to make a standard or compare one route with another.

The ideal condition is to have one company in a city with

stations so located that the wagons will not have to travel more than a mile from a station.

The district allotted to a station should not be larger than can be covered by twenty-four wagons. This is sufficiently large for one superintendent and four foremen to handle efficiently. As all accounting should be done at the main office, one clerk with an assistant during the peak period should be able to take care of the weighing and necessary clerical work.

**Designation of Districts and Routes.**—The districts should be designated by letters. Wagon shop numbers and route numbers should be significant of the station to which they belong. For illustration: The route numbers in District *A* should run from 1 to 50, wagon numbers from 100 to 150. District *B* route numbers from 51 to 100, wagon numbers from 151 to 200, and so on, allowing 50 numbers for each station. Wagon route number plates should be made so that they can be easily affixed and detached, as no wagon should be permitted to go on a route without the proper route number on it.

The superintendent, foremen and clerk should be on duty before the first wagon is loaded. There should be a time limit for the drivers to report. A driver failing to report within the limit should be marked absent and his wagon taken out by his foreman.

The superintendent and foreman should perform the duties as set forth previously.

**Weighing of Wagons.**—As the wagons are loaded, they should go over the scales and be weighed by the clerk. The gross weight as shown should be immediately entered on a form provided for the purpose. Wagons should be weighed every time they enter or leave the station. At the close of the day the total of the inweights deducted from the total of the gross weights will be the amount chargeable to the driver. The amount of coupons and weight tickets returned by the driver will be credited to him.

Each driver after weighing out should receive his coupon pouch, which he should sign for, and all orders for new customers, etc., on his route. Two pouches should be provided for each driver so the clerk can fill the pouches when it is convenient for him to do so.

The driver should call up for orders at least three times each day. The last call should be made just before he finishes his route to return to the station.

There is a great loss of time on most every route where supervision is lax. The only way to overcome that is by studying each individual route, and that is the duty of the foreman when he is writing the route, and if he is coached along the lines to follow it is surprising what results can be accomplished.

Foremen should write one of their routes each day. They should avoid writing the same route on the corresponding day of consecutive weeks. It is sometimes advisable for a foreman to write the same route several successive days. Route books and foreman's report cards should be turned over to station clerk upon completion of the day's work. The report cards should be sent to the main office for the purpose of checking them against the drivers' report for the day and inspection by the Superintendent of Delivery.

The route book containing the last writing of each route should be retained at the station. All books previous to the last writing should be sent to the main office for checking purposes, after which they should be returned to the station and filed in such manner as to be easily accessible. Route books will be found of much advantage the following year for canvassing purposes.

**Canvassing.**—During the canvassing season, drivers should be given the route book of the corresponding date of the year before, and a memorandum book, and instructed to call upon all the old customers. Many ice customers commence taking about the same time each year, and the route book will be of assistance to the driver in inducing former customers to start by informing them that they commenced taking about the same time the previous year. It is surprising how many people will be influenced by that fact.

It should be impressed upon all drivers that they shall not confine their canvassing efforts to old customers only, but to canvass every house on their route, as each one is a prospective customer. They should check off in the route book customers called on and the results. Note in the memorandum book results of interviews with prospective and new customers.

When routes are split up it is a good idea to have cards made out for all customers on each route and given to the respective drivers. This card should contain the name, address and other necessary information concerning each customer. The foreman should go on the new route to instruct and assist the driver in canvassing.

A good method to follow when canvassing is for the foreman to take one side of the street and the driver the other and canvass each house, leaving a window card at each. This plan should be followed on every street on every route. The foreman should inspect the route and memorandum books of all their drivers to find out if each one is thoroughly canvassing his territory. The advance dates when customers will commence should be listed, and the foreman should check these up to see that they are served, and if not, the cause.

**Putting on and Taking off Wagons.**—During the period between April and June it is often a serious question how fast the wagons should be put in service. Local conditions govern this to a certain extent. During the month of May the average daily tonnage of a one-man, one-horse wagon in service should be about 4,000 pounds before another wagon is added; during June this should be increased to about 5,000 pounds per wagon, and in July 6,000 pounds per wagon. These figures do not include the heavy all-year-round trade, which is mostly in the downtown districts. They refer only to the general run of mixed summer trade, and it must be understood that some wagons in the scattered districts may not sell over 50% to 75% of the amount stated, but in the more thickly populated districts others will sell considerably more. The amount of ice possible for one wagon to handle in downtown districts is governed entirely by local conditions.

As soon as the daily average begins to drop, usually about the beginning of September, the wagons should be taken out of service rapidly, in order to reduce the expense, and an effort made to retain a high daily average for the wagons in service during the fall and winter months, or until the canvassing season opens again.

It is the tonnage per man that increases or decreases the cost of delivery, but in putting on and taking off wagons care must

be exercised so that the service will not be impaired. Each station should be supplied with a sectional map on which the boundaries of the various routes should be shown. Careful study of the map, in connection with the tonnage handled on each route, will be of great assistance to the superintendent in splitting up and doubling up routes. The station superintendent should discuss with the Superintendent of Delivery the advisability of changing routes. No change should be made without the sanction of the Superintendent of Delivery.

While it is advisable to maintain permanent boundary lines for the yearly routes in doubling up routes, it will very often be found that by increasing the boundaries of two or three routes one route can be taken off without at all impairing the service. Later the three can be doubled into two, and finally get down to the lines of the permanent route.

When doubling up routes, if the card method suggested for use when splitting up routes is used, it will minimize the possibility of customers being overlooked. Many ice consumers who would have continued taking ice for a longer period have discontinued buying, simply because the driver demonstrated to them by not supplying their needs that, while it was not so satisfactory or convenient, it was possible to do without ice in cool weather.

**Special Service.**—A special delivery service should be maintained for emergency orders and for quick service. A light truck is best for this kind of work, and there are a number of trucks suitable for such purposes now on the market.

Where window cards are used many customers forget to put up their card until the driver has passed, and sometimes do not think of ice until late in the afternoon. They do not relish being told "that if they want ice they should put up their card; that the wagons are all in and men gone, etc." They want ice, not talk. Then there are people who have just returned from out of town late in the day and want ice; customers who have moved from other routes and failed to give the driver the new address, or did so, and the driver failed to report it; the itinerant peddler's customer whom he missed or was unable to serve, and last, but not least, in cases of sickness where ice is needed for immediate use.

When a customer needs ice and is unable to get it, that sale is lost forever ; consequently, to increase ice sales it is good business to be prepared to furnish the consumer at all times within reason. The amount of advertising received, and the good feeling engendered among consumers by such service amply pays for the expense. A good way to emphasize the fact that they are getting special service is to have the words "Special Delivery" painted on the truck in letters easily distinguishable.

**Handling Complaints.**—As it is impossible to follow each wagon each day to note all deliveries, it is advisable to impress on the customers that at any time they think they are getting short weight, poor service, etc., to immediately notify the office. Such complaints should always be investigated at the earliest possible moment, either by superintendent, foreman or inspector, regardless of how unreasonable the complaint may seem. Invariably the trouble is straightened out and affords an opportunity of ascertaining what sort of a man the driver is, and by the time several complaints from his route have been investigated he learns that he is being watched closely and will be more careful. If he is dishonest, or persistently disregards instructions, he should be dismissed. It also has a good effect on the trade, and they soon realize that the management is anxious to please and really want to know when the service is not satisfactory.

Many companies equip their men with rubber aprons or back pads which have pockets in them for catching the meltage. With such aprons it is possible to carry and put the ice in the box without wetting the floor. Another advantage in the use of the apron is that several customers can be served with one trip from the wagon to the house. For instance, three customers, two of them wishing twenty-five pounds and the other fifty pounds. The driver can carry one hundred pounds to the rear of the house and with his pick he can split the piece into the required amount wanted by each with the saving of time required to make extra trips to the wagon.

**Things That Should Be Prohibited.**—Cutting of ice on the pavement should be prohibited. All ice should be cut in the wagon so that it may not come in contact with the dirt and filth of the street.

Smoking of pipes, cigars or cigarettes while making the de-

livery should be prohibited. Housewives do not care to have the rooms in their house permeated with the rank odor of tobacco, or to have the contents of their refrigerator spoiled with tobacco ashes. Wagon men have plenty of time to smoke between deliveries.

No person should be permitted to ride on a wagon who is not an employee of the company. The wagon bum is a pest who in many ways is a detriment to the driver, the customer and the company. Any driver who persistently disobeys this rule should be discharged.

**Regularity in Delivery.**—Regularity in the hour of delivery is one of the most important points to be considered in operation. Many things influence regularity, such as sudden changes in weather, certain days of the week when all take ice, the removing and replacing of articles in ice chambers of refrigerators, etc. However, one of the greatest drawbacks to regularity in time of delivery is the habit persisted in by a large number of drivers, of changing the direction of their drive almost every day.

If a man will drive his route the same every day many of the other things that tend to retard him can be overcome. If customers can expect him at approximately the same time each day a few courteous words from him will induce many, if not all, of his customers to have the box ready. Sudden changes in weather can be met by speeding up; on bright days he can take things a little easier. Accurate knowledge of what each man is doing and careful supervision of reports will inform the superintendent when it is necessary to split the route to prevent it becoming too heavy for him to serve and maintain regular service.

The Citizens' Ice Company of Toledo, in order to prevent congestion during the loading time, has the men report in various shifts, a fifteen minute interval elapsing. By this method the early men have a chance to get their wagons loaded before the later men report. Wholesale trade drivers, of course, are the early ones, with private routes last to report.

The company serves the domestic trade in the morning, leaving the butcher hauls and heavy drops until afternoon. Most of these heavy drops are phone orders, and as the customer is apt to be busy and forget his requirements, thus causing inconvenience and a possible loss, a chart containing the number of

all afternoon customers is kept at the station. The time of the filling of each customer is marked on the chart so that the superintendent can readily see when a customer needs ice. In the event the chart shows that ice is needed, and the customer has not called in, his attention is directed to this matter by either a personal call or a phone message. This not only helps the customer, but allows the superintendent to distribute his work more evenly during the week.

However, the commercial trade itself is usually fairly easy to take care of. It is in the domestic trade that the average ice man experiences most of his grief, and expense. To cut this down as much as possible the Citizens' Ice Company inaugurated the following system: All private customers with the exception of a few who are designated as "call stops" (meaning the driver takes care of their ice requirements by stopping and looking at the refrigerator), are equipped with window cards. Now it is perfectly natural that, especially when routes are changing, that some housewives get their cards up too late and some not at all, and there is a consequent phoning into the office. To off-set this as much as possible, the system of having the driver call in three times when on his routes was placed into effect, but many calls are received long after the driver has reached the station with his route completed, as the housewife got busy and forgot the ice until the last minute, and various other excuses.

With the majority of the housewives this is but a matter of education, and it has been customary in the past for the company to run what was known as "call contests." The drivers having the least number of calls in the period of two weeks in the spring received prizes. The prizes consisted of first, second, third and fourth places, and the man having the most number of calls received a lemon. This was usually presented with a "hurrah boys" accompaniment, and the ridicule and kidding that went with it was not at all desirable. Therefore, all drivers that were not in the running for the money kept "on their toes" to avoid the lemon. These contests proved that most routes could be run without many calls. It was simply a question of getting the information to the public and, as usual, they would do anything reasonable. As the call contests were put on in the spring, the company believes that they more than paid for themselves. Calls



that do come in are taken care of by special delivery if phoned in before 3 p. m. After that time, except in case of sickness, or equal necessity, a customer is directed to the nearest station, which is usually within a short distance of home. It was found this plan would do much to reduce the special delivery evil.

**One-Man, One-Horse Wagon.**—The demand from the household trade for morning service is constantly growing.

The class of trade that is worthy of the effort to satisfy is the class that comes on early and stays late. Most of this class of trade appreciates service; with them price is secondary, but it wants that service punctual, and wants it in the morning. Big routes, with two and three men on, cannot give such service. The drive is usually too big; there are too many customers, and so much time wasted that it is impossible to be regular in the time of delivery, or get around to them all in the morning. The remedy is the one-horse, one-man wagon.

It is being demonstrated every day in the companies that operate them that the one-man wagon will give better service to the consumer, and a bigger tonnage per man to the company. It is a logical result. There is no time lost waiting for one another, no time lost in conversing with one another, and the missing of customers is reduced to a minimum. As there is only one man on the wagon he knows he has to serve each customer, therefore the old excuse, "I thought the helper served her," cannot be offered. The one-man wagon not only gives improved service and more tonnage per man, but it attracts and holds trade, and is more economical. For illustration:

In a company operating twenty-four route wagons and five 7-ton trucks, handling manufactured and natural ice, with five loading points, in a city of 150,000 population, the highest daily average for a wagon during the month of July was 6.7 tons. The average for all wagons for the month of July was 3.7 tons.

**Cost of Replacement.**—As an illustration of the cost of replacing two-horse wagons with one-horse wagons and the saving effected in a company such as referred to, assume that the trade on eighteen of the twenty-four routes is such that one man can serve it; also assume that the average tonnage for the four months is the same as the July tonnage, 3.7 tons per day. That would

make an average daily tonnage of 66.6 tons. To get this same amount of tonnage would require twenty-six single wagons, assuming that each would average 2.5 tons per day, which is a low average. The wages paid by this company at that time was \$3.27 for drivers and \$2.69 for helpers, a total of \$107.28 per day for the eighteen wagons. Twenty-six drivers at \$3.27 would make a total of \$85.02, a saving of \$22.26 per day. To operate the eighteen two-horse wagons requires forty horses; to operate the twenty-six single wagons would require thirty horses, a saving of ten. Now take the initial outlay necessary for the single wagon outfit:

26 single wagons, at \$300 each.....	\$7,800.00	
26 sets single harness, at \$50 each.....	1,300.00	\$9,100.00

#### Savings Effectuated

10 horses less, at \$300 a head .....	\$3,000.00	
Saving in feed, 10 horses, 4 mos. at 90c a day .....	1,098.00	
Saving in wages, 4 mos. at \$22.26 a day.....	2,715.72	
Depreciation on 10 horses, 4 mos. at \$50 year, 166.00 .....		\$6,979.72
		<hr/>
		\$2,120.28
Return from sale of 18 wagons at \$60 each, \$1,080.00 .....		
Return from sale of 18 sets harness, \$15 each, 270.00 .....		\$1,350.00
		<hr/>
		\$ 770.28

The savings effected the first year leaves the sum \$2,120.28 as the net cost of the new equipment. The sale of the old equipment as shown would reduce the amount to \$770.28. Even though the old equipment is not sold, the saving in wages alone the next year is more than the balance of the cost of the new equipment, and the savings of the other two items leaves a profit.

In two years the new equipment is paid for and the assets have been increased the difference between the new and old equipment. It is very evident, therefore, that the institution of one-horse wagons is not an expense, but an interest-bearing proposition. There are other saving features in connection with the above that will occur to the reader if he will con the matter over in his mind.

**Helpers.**—There is one very important feature in connection with the one-man, one-horse wagon that should outweigh the cost of installing such equipment, and that is the elimination

of one of the most expensive and inefficient features connected with the delivery of ice—the helper.

It is not alone the amount of money paid helpers in wages, but the poor service and loss of time occasioned by the use of them.

With two men on a wagon the usual custom is for the driver to serve all the houses on one side of a street and the helper all on the other side. By this method of serving a route the driver, who should know the location and the size of the piece of ice that will fit the ice chamber of the refrigerators of all of his customers, only possesses that information of a certain number of the customers on his route. When a helper quits or is discharged and a new man is put on the wagon, he has to go it blind, because the driver cannot instruct him concerning the customers. Therefore, those customers will receive poor service until the new helper becomes acquainted with conditions.

When the driver is absent for any cause and the foreman or another driver is put on the wagon, the same thing occurs; the helper does not know a thing about the customers the driver served because he never served them.

Such a condition should not be allowed. The driver should, at some time or other, serve every customer on his route. By doing so he becomes known to the customer or maid, and very often will find that the service the helper has been giving is unsatisfactory.

Some may take exception to the above on the ground that the same man serving the same customers each day can give better service than where there is a continual change.

Another point to be considered where helpers are used is that often a helper will develop into a better man than the driver and it is desired to make a change. Such changes should be made on short notice, but if the helper, no matter how good a man he might be, only knows a certain number of the customers, such a change cannot be made.

Where two men are responsible for any route it very often happens that the driver expects the helper to attend to customers in certain places and the helper thinks that the driver has attended to them while he was away to a distant customer. The result is that one or more of the best customers is overlooked

accidentally, but, nevertheless, it makes them sore, as they had to call up the office, and also had to wait until late before they could be reached, and it has always seemed too easy a matter for one to shift the damage and complaints off onto the other man.

In almost all localities there are some customers a little way off the street and it is necessary to carry the ice some distance. While the helper is gone the driver is compelled to either go on alone or else wait until the helper shows up. Sometimes it only takes a few minutes and other times it takes fifteen. It all depends on circumstances and how much stuff there is in the refrigerator to take out and put back, and how much the hired girl has to tell before he can get away. Sometimes, when it is a Svenska, she will want him to have a cup of coffee. While waiting the driver could have waited on half a dozen customers.

Mr. George L. Bennett, consulting economist, New York, made a very exhaustive study of the costs of delivery of ice in New York, in which considerable attention was given to the use of helpers. In that part of his report dealing with helpers Mr. Bennett says that at times a helper is a necessity where the customer requires large pieces of ice delivered into places so difficult of access that one man cannot well perform the work alone.

And hence, since this result can only be attained either by hustling up the driver on his work of delivery proper (i. e., reducing his time spent in delivery during which the driver is busy delivering and vehicle stands still before customer's door), or by giving him help so that the same result is attained, it would seem that the helper is always and everywhere the logical thing.

Computations made from the data on which this report is founded and which takes into account the uselessness of the helper during all time spent driving between customers on the routes and from station to route and time going in for more ice and back to routes again, show, however, as per following table:

Efficiency of helper compared to driver	Effect on costs of employment of helper
100%.....	Savings of eight cents per day.
90%.....	Loss of sixteen cents per day.
80%.....	Loss of forty-two cents per day.

One hundred per cent here means that the helper and driver accomplish just twice as much on the work of delivery proper all day long as the driver would alone.

So that it will be seen the efficiency of the combination for the whole time must be high indeed to make any gain by use of helper at these prices so far as mere costs of service are concerned. It will be shown later that there are other considerations which modify this, but only in so far as lack of additional equipment is concerned.

While there are times when, as in case of hoisting ice into butcher's boxes and possibly in case of elevator work in some few special apartments, in general it is difficult to make their separate jobs finish closely enough at the same time to avoid either a slackening of speed on part of one of the two or an actual waiting of one for the other.

The driver and helper have a partial incentive to speed in that they can generally go home when they finish their route, provided they do not finish too early. But even with this incentive, the relations of driver and helper are generally governed by a camaraderie which does not permit the driver to require the helper to follow directions very closely. And thus, even if the driver be a good manager, which is by no means always the case, the efficiency of the team stands chance to be low.

These combination efficiencies have not been measured so far as is known by any one. But, nevertheless, some very shrewd icemen are abandoning altogether the use of helpers. They have not figured it out in the way here shown, but their figures or beliefs nevertheless pointed out to them the loss in the use of helpers.

Apart from making all the savings possible, the question is often one of getting customers served and the ice sold with the equipment available. And thus even though there may be a loss of forty or usually a great many more cents a day, by increased expense, there is, to offset this, the increased profit due to the larger amount sold. But it is only where equipment is not available that this cut into profits by increased expense is proper.

**Zoning Method.**—The zoning system (deliveries on alternate days) is another plan that received considerable impetus

as a result of war conditions and was tried out very effectively and received favorable approval in many cities.

The system itself is not new, as it has been used in many cities during the winter months for a long time. Its adoption in congested residential sections of large cities during the summer months is dependent upon so many things that it would require considerable effort and time to get such a plan into operation. At the present time the ice chamber in a large majority of refrigerators will not hold sufficient ice to last two days. However, there are a large number of ice users who take ice only every other day. Again, there are many others who want ice delivered every day, even though their refrigerators are large enough to hold a sufficient amount to carry two days. To put into practice a system of deliveries on alternate days in congested residential districts would require co-operative effort on the part of companies in each city to educate the ice consumer to the benefits accruing to them through such a system.

That such a system would be beneficial in many ways is apparent when consideration is given to the fact that where ice is delivered only every other day the necessity for putting up an ice card or keeping on the lookout for the ice man is reduced one-half. Another point is that no matter how careful delivery men are, there is more or less dirt carried into the house and dripping water on the floor while making a delivery. That feature could also be reduced one-half. Another point is that the larger the piece of ice the longer it will last and the more refrigeration be obtained from it, because a piece of ice that completely fills the ice chamber has less space to refrigerate in the chamber before it can perform its function of refrigerating the food compartments.

In Flint, Mich., an ice company which had been making deliveries only three times per week during the winter months for several years has extended the period to nine months, giving daily service only in June, July and August, and it is planned to increase to a considerable extent the territory that will be served only three times a week throughout the whole year, summer included.

The company started the plan in a few small sections of the outlying districts and found that all of the customers got through

the warm spell nicely. These customers took 50 pounds every other day for two days and 75 pounds for the third day, and larger quantities in proportion to the size of their ice box. The manager of the company states that he is doubtful as to whether such a plan could be worked out satisfactorily during the warm months in the more congested and business districts, especially where there are many small stores and restaurants, but it certainly can be used in the outlying district, and it is in that territory that the cost of delivery always runs too high.

In another city in Michigan one company makes deliveries only four times a week. Four other companies deliver ice every day, and the dealer who makes only four deliveries states that in six years he did not believe he had lost over a dozen customers owing to the skip-day service.

The system has been tried out in Detroit, Mich., Toledo, Ohio, Pittsburgh, Easton and Erie, Pa., and many other places. The value of the zoning system as an economic measure is apparent to all who have given consideration to the subject.

In Boston, Mass., where it is in operation in certain sections throughout the year, it has saved approximately 30 per cent of teams and man power. If due consideration is given to peculiar local conditions it is believed by those who have given the subject considerable study that the plan can be used in all large cities.

There are sections in every city where the plan could be put into operation throughout the year and give satisfactory service. In many sections it could be put into operation for the winter months, and the time gradually extended in such manner that the customers would become so accustomed to it that it would only be a question of time when the plan would be continued through the entire year.

However, until there is a better understanding of delivery costs and closer co-operation among manufacturers and dealers, it is doubtful if the plan will become general.

**Ice Delivery Companies.**—Ice delivery companies in each city, one or more according to the size of the city, population, and location of existing plants, is the plan that appears to be the most practical for solving the problem of distribution.

The greatest obstacle to the formation of general ice delivery companies has been the rigid anti-trust laws, national and state.

Even during the period of the war, when conservation of everything was absolutely necessary, and with the Food Administration favoring the project, very little headway was made.

Another difficulty is the inability of those interested to agree upon an equitable basis of operation and remuneration. As an instance of this, Jos. Adams, Cincinnati, O., cites the hopes and disappointments involved in the first experiment in organizing a general delivery company for his home city. Chief among the difficulties was that of efficient management, resulting from the many conflicting interests represented in the organization. In some cases it was not possible to dispense with delivery routes to the extent that had been hoped, and where routes were discontinued, there was dissatisfaction at times on the part of the customers, thus bringing about a situation where outsiders could come in and erect a new plant and thus defeat the purpose of the delivery organization. Even in cases where a member of the delivery company recognized the necessity of a plant in a developing territory, it usually proved impracticable to secure the sanction of the directors to permit an increased percentage of total output being allotted to any member who might build the plant. Competition was thus invited and a plant built by an outside man would not only get the new trade, but a portion of that formerly served by the delivery company.

The successful consolidation of delivery companies has been effected in several cities, among which is one at Dayton, Ohio. The plan adopted in Dayton was to have preferred stock, bearing six per cent interest, which was issued at payment of equipment taken over from the manufacturing companies by the delivery company. Common stock was apportioned among the manufacturing companies in proportion to the amount of ice they would furnish for delivery. Such equipment as could not be taken over or utilized in the new delivery company was considered by issuing ten per cent of its appraised value in preferred stock to the companies retaining same. The question of the amount of ice to be delivered by each manufacturer was determined by taking the sales of all of the manufacturers for the previous two years, and totaling them, then determining the percentage of this total sold by each manufacturer, this percentage to govern the amount of the daily sales of the delivery company to be furnished by the



respective manufacturers. If any manufacturer failed to furnish his quota on any day, and the amount was made up by another, this amount was not charged against the percentage of the manufacturer so supplying the deficiency.

The price paid the manufacturer for ice was \$3.50 per ton. This practically only allowed the delivery company to break even. Experience proved that the price should fluctuate and be subject to change by agreement every six months or at least annually, and in case of failure to agree, it should be thrown into arbitration, the determination by this means being final.

The average price received per ton for all ice sold is an important factor in establishing a price which the producer should charge the delivery company if the proposition is to be an equitable one. The gross income, less the amount paid for ice on which no income is received, due to shrinkage, divided by the number of tons sold, gives the average gross price received per ton of ice sold.

For instance, the established price at which ice is sold to the consumer may range from \$6.00 to \$9.00 per ton. We will assume the company buys 65,000 tons of ice and its net sales are 58,500 tons, of which 23,400 tons, or 40%, are sold at \$6.00 per ton; 11,700 tons, or 20%, are sold at \$7.00; 8,795 tons, or 15%, are sold at \$8.00, and 14,625 tons, or 25%, are sold at \$9.00. The total amount received for the 58,500 tons on the above basis amounts to \$421,285; from this must be deducted the amount paid for the 65,000 tons (10% shrinkage), from which no income is received. If this price should be \$4.00 per ton, we have to deduct \$26,000, leaving \$395,285, which, divided by 58,500 tons, gives an average ice sale income of \$6.757 per ton. Deducting \$4.00 per ton as the purchase price from this amount leaves \$2.757 per ton to bear the delivery expense and pay dividends to the stockholders of the delivery company.

Experience of the Dayton company showed that cash-and-carry stations could be operated more successfully by a centralized delivery company than by individual companies, thirty-eight successful stations being put into service by the delivery company of this city. Another result has been that deliveries have been effected by this company with 35% less wagons and 40% less men than were used by the two companies formerly delivering

their own ice. The total sales for the year were 20% more than both companies had sold the year previous.

A significant point brought out in this connection is that while peddlers may not be entirely eliminated, where all manufacturers will not come into such an organization, still any manufacturer selling to peddlers will be benefited by joining in a delivery company, since he is then dealing with a responsible concern, instead of with a number of more or less irresponsible customers.

In Grand Rapids, Mich., a general ice delivery company was formed under a plan that received the approval of the Food Administration. The plan is similar, in many respects, to the one adopted in Dayton, and has been pronounced as being one of the best thus far proposed. Its salient points follow:

The capital of the delivery company shall equal the property now used by the different individual companies delivering ice, which is to be turned in to the new company on a valuation by outside authorities, and for which stock is to be taken by the different ones now in the business in proportion to the amount of ice they are delivering. Any difference between the value of the equipment and the proportion of the business to which an individual company is entitled will be settled on a cash basis. This proportion was worked out on a basis of the total tonnage sold by each company over a certain period of time, and bears the same relation that their volume now bears to the total business they are doing.

The appraisal is to be made by disinterested parties who have no connection with the companies involved.

The delivery company is to buy the delivery equipment, such as horses, wagons, motor trucks, etc., but does not buy any of the real estate.

The delivery company agrees to lease such stables, yards and other equipment as the management of the delivery company shall deem necessary on the basis of 10 per cent of a fair value of the property so leased.

The delivery company does not take over other business which any one of the ice companies may have. They assumed that in the case of dealers having a coal business in connection with the ice business, some arrangements might be made for renting the equipment for the coal business in the winter when the ice com-

pany did not need the entire amount of equipment for their own business.

A delivery company that has proved very successful was put into operation in Little Rock, Ark., in 1919. The company was a separate and distinct organization, not connected with the producing companies except in so far as mutuality of interest was concerned. The company purchased ice from five producing companies. The delivery equipment owned by two of the companies was purchased by the delivery company at a price established by two disinterested men, a veterinarian and wagon builder. Contracts were entered into with each company for a stipulated amount during the year, with a penalty clause of so much a ton for all tonnage not taken up to the contract amount. The amount to be purchased from each company was based on its capacity and the total amount sold by each during the year previous to the formation of the delivery company. The price paid to all was the same. All ice sold at the platform of the various plants with the exception of cut ice up to 300 pounds was sold for the account of the delivery company up to its contracted amount. This included all ice sold to peddlers, dairymen, ice cream manufacturers, etc., and car load ice.

Further information concerning this company, with description and illustrations of the forms used in its operation, is given in the chapter on Accounting.

That one delivery company in a city is the only solution of overcoming the great economic waste continually going on in the delivery of ice to the consumer seems to be without question, but one of the largest and most prominent men in the industry in discussing the subject said he felt it was not desirable for one man or set of men to have absolute control of the ice industry in any given locality. A better plan is to have a large company, especially in cities of two hundred thousand population or more, this company being large enough to dominate the local industry and yet not large enough to be considered a monopoly.

Such a company is able to set a pace and to put into practice modern and scientific methods, and just as soon as it is in existence and organized for the good of the community, conditions will change for the better.

Of course, such a company must realize that the people of

the community are there for some other purpose than to be exploited by the ice men, and that the ice industry owes a duty to the people and is deeply obligated to them in the matter of making sure that the best and the most economical conditions are established.

This means scientific operation, in which advantage is taken of all modern business methods, and the savings resulting therefrom are divided between the company and the customer. That a company able to control approximately thirty per cent of the business, or possibly thirty-five per cent in the larger cities, would be of sufficient size to operate economically and assume an independent attitude. That at least twenty per cent of the business outside of such a company would be too far away, and would not conflict, especially in large cities such as New York and Philadelphia where business in the suburbs would not conflict with the general ice situation in the city proper. For example, he did not believe one large delivery company for New York City would be practicable.

Such a plan, unless companies were restricted to certain districts, would not reduce the economic waste due to duplication to any considerable extent.

As long as there are a number of competing companies in each city it will always be a difficult matter to obtain absolute control over the actions of delivery men in serving the trade. Where there is only one company it becomes absolutely necessary for them to conform to the rules and regulations established if they expect to hold their positions. Otherwise they will be compelled to go to some other city or seek some other occupation.

## CHAPTER V.

### SERVICE.

**Factors.**—Ice delivery is primarily a service proposition. Price in some instances is important in obtaining customers, quality very little. But it is the service given in the delivery of the product that is the biggest factor in not only obtaining trade, but in holding it after it is obtained. What duties should be included in the service given to the consumer has received a great deal of discussion, and there is a wide divergence of opinion as to what should be included in a satisfactory service.

There is one point that should be considered in connection with service, and that is that the primal purpose of all ice companies is to sell ice. The income received from one customer in one season will pay for quite a few special deliveries. The income lost through a customer quitting is not so important an item financially, but the subsequent loss occasioned by a recital of her treatment to all of her neighbors and friends is something to be considered.

**Service More Important Than Quality.**—The great amount of publicity that has been given to the service facilities offered the purchaser in many lines of business during the past few years has made this feature a prominent factor in securing and retaining trade, with the result that the public expects much more from the merchant and manufacturer than ever before.

This is particularly true in the ice industry, where service is more important than quality. Unlike the baker and the dairy-

man, whose customers buy daily, the ice man has to maintain a service which goes daily over its route, in sunshine or in rain, hot or cold, ready to serve when the customer wishes to be served, if not today, then tomorrow or some other day. It has to be there to serve, not at the option of the company, but to serve whenever service is desired.

It is doubtful if there is any other business in which the consumer takes so much advantage of the service feature as is done in the ice business. This fact is due, in a large measure, to duplication of delivery service and the intense competition among ice companies.

Under the conditions existing it is almost impossible to define just how far to go in the matter of service, but careless, slipshod methods in supplying ice to the public will not be tolerated; in fact, they should not be.

A service to be efficient must give entire satisfaction. To give entire satisfaction means more than simply delivering the goods in an efficient manner. It means that all transactions with the customer, from the first interview or telephone call, shall be made in a courteous, affable and intelligent manner.

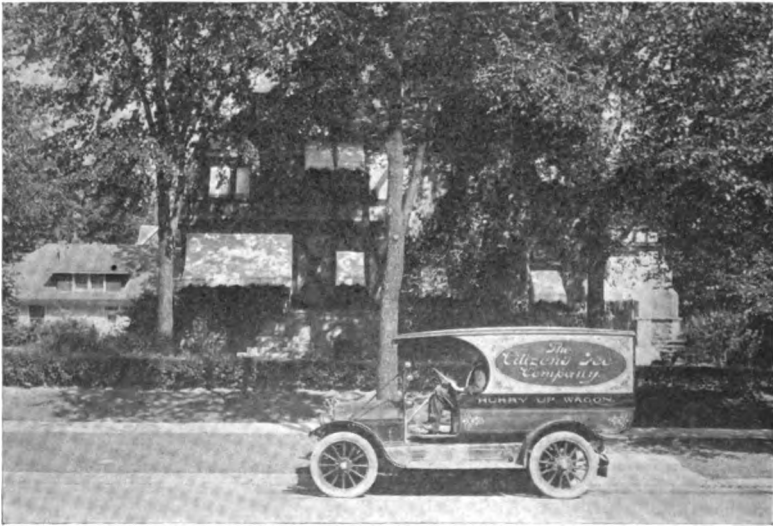
Very frequently when customers make complaint that they did not receive ice the office employees will tell them that if they expect to get ice they must do so and so, otherwise they cannot expect to get it.

It is well for every owner or manager to realize that the public does not have to do anything. It is the company that must do things. That is what they are in business for. When an ice company solicits the trade of the public it assures them that it will serve them in a satisfactory manner. Therefore it takes upon itself an obligation to fulfill its promise. Sometimes, as in the case of special deliveries, its obligation entails a monetary loss. That is no reason why it should attempt to evade its obligation by telling the customer that if they had put up their card, or had been home when the delivery man passed, they would have received ice.

A housewife or maid has many other things to do besides putting up an ice card, or being continually on the lookout for the ice man. Everyone forgets things at some time or other; the customer may forget to put up the card. She may wait until

the regular time for the ice man to arrive, and then having to go somewhere it is not to be expected that she should wait another hour or so for him to arrive.

Is it good business, in such cases, to inform the customer, when she calls up for ice, that you are very sorry but the fault lies with her and not with the company, and you cannot make delivery that day, but will see that she gets ice the first thing in the morning? It may be the first time she has ever asked for a special delivery; she may have a refrigerator filled with foods. Is the company living up to its obligation if it allows those foods



ADVERTISING SPECIAL DELIVERY SERVICE

to spoil because it will entail a small loss to make a special delivery?

Every business has some features that are not profitable, but the losses are considered as part of the expense of doing business and are included among the other costs in establishing the selling price of the article.

Very often customers who have been missed can be served without any additional expense. Wagons may be out that on the way back to the station pass by such customers, or within a block or so. It is a very simple matter when the driver of a wagon

calls up the office before coming in to tell him to serve such customers.

While the question of price is the principal feature in agitation for municipal plants, the subject of service is also a contributing factor in such agitation. If customers are furnished a satisfactory service there will not be much complaint about price unless it is really excessive. But when the price is high and the service poor the customer is justified in complaining, and it is perfectly natural they will favor any plan that promises relief.

Every officer and employee of a company who deals with the public should bear in mind that their success and the success of the company depend upon their attitude and actions in dealing with the public—the consumer. The public does not consider them as individuals, but as the company they represent, therefore their attitude is taken as reflecting the company's attitude.

**Service vs. Super-Service.**—There is considerable difference of opinion as to just what should be considered satisfactory service and so-called super-service in the delivery of ice.

Without doubt most housewives would like to have their ice delivered between 8:30 and 10 a. m. That, of course, is impossible. Some customers are very insistent in their demand that they must have their ice in the morning; others do not seem to care what time the delivery is made, so that it is regular; that is, somewhere near the same time each day; not at 10 o'clock one day, 12 the next, and 3 o'clock the following day, and so on.

There can be no doubt that regularity in delivery, correct weight, quality, cleanliness and neatness in placing the product in the receptacle, courteous and respectful treatment of the customer when making a delivery and in handling complaints, and a desire to please are absolutely necessary to give a service that will satisfy.

To furnish a satisfactory service without an efficient organization is impossible, as without organization you have no control over the actions of the deliverymen, therefore the delivery will be irregular, incorrect weight given, deliveries made and treatment of customers, etc., will be according to the mood of the men.

Many drivers never drive their route the same way two suc-



cessive days, therefore delivery on such routes is always irregular. This is bad for the customer and company both, especially where coupons are used. Many people place their cards up at a certain time each day and where drivers pass over certain streets at 10 o'clock one day and at 8 o'clock the next day many customers may not have their cards up. This necessitates a telephone call and in many cases a special delivery. Where drivers are at all punctual in their time it is not a difficult matter for them to induce customers to have all articles removed from the ice chamber, which makes for cleanliness in delivery, as there is no dripping of water on the floor while the driver removes articles. It also makes possible increased tonnage, as no unnecessary time is lost. It is not to be expected that customers will remove articles when they have no idea when the driver will call.

Each route should be considered individually. Drivers know the peculiarities of most of their customers, especially regarding the times at which they wish to be served, and in writing routes foremen should ascertain all that information and then arrange the drive so that the greater number will receive their ice at or as near the time they want it as possible, and then see that their instructions are followed out without deviation. A courteous explanation to those whom it is impossible to get to at the time they want ice will, in most cases, satisfy them.

**Layout of Routes Important.**—Properly laid out routes is an important factor in service. In many companies very little thought and study apparently has been given to route conditions. This has resulted in routes irregular in shape, unequal in drive in proportion to customers served, small in territory yet so congested it is impossible to give the service, routes which overlap each other, etc. Such conditions make it impossible to furnish a regular service, which is very important.

The ideal route, from a service point of view, is one that is a perfect square, making it possible for a driver to reach any point of his route by a short drive.

The subject of giving to the customers the weight for which they pay is an important one. While it is not possible to cut each piece of ice exactly to the required weight, it is possible to

cut within two pounds either way, and in a week such pieces will equalize each other, unless the driver persistently cuts all of his pieces short. No matter how generous the allowance for shrinkage may be, some men will continually shortweight the customer. This can be reduced to a minimum by having the routes written each week by the foreman. Also by having inspectors go on the routes and weigh the pieces after they have been delivered. Such service is quickly appreciated by the customer, as it indicates the company's desire to protect the interest of the consumer and inspires confidence as to the integrity of the company.

The old saying that ice is ice is true. All ice will give refrigeration. Family trade not only uses ice to cool the contents of the refrigerator, but makes use of it in drinking water and in direct contact with food. This fact is evidently unknown or forgotten by many delivery men. The top of natural ice very often contains minute black particles, which are perfectly harmless from a health standpoint, but when a small piece containing such particles is put in a glass of water, on the butter, or in contact with any other food on the table, it is not apt to increase one's appetite. The butt end of much manufactured ice is usually the poorest portion of the cake and yet many men will deliver that portion to family trade and put the clear portion into butcher shops and store boxes. Companies that pay attention to this feature do not have any complaints about the quality of their ice, and have a strong talking point against the competitor who permits such ice to be delivered.

A clean looking delivery man in uniform is not only pleasing to the eye, but produces the impression upon the customer that the product which he delivers is clean. A man who is clean in appearance is likely to take pride in that fact and will endeavor to do his work in a cleanly manner. Such men will familiarize themselves with the size and shape of the refrigerators on their routes and will cut the ice on the wagon to fit each particular box, instead of taking a piece and chipping it off after reaching the refrigerator. Chips fly, and wherever they alight they leave a small spot of water. Such practice is not apt to please any housekeeper or maid. The carrying of street dirt into the house can and should be avoided. A clean man will not do, and the slovenly man should not be allowed the opportunity.

A slovenly, surly, intemperate man, irrespective of his ability to handle or cut ice, should not be allowed to serve a family route. The possessor of a pleasant smile and a cheery greeting will hold his trade against almost any inducement offered by a competitor. There will be few complaints from customers served by such men.

There will be times, despite every precaution taken to prevent them, when complaints will be made. Many of them may seem absolutely unjustified and without cause. Many people will judge a company by the manner in which complaints are handled.

The complaint department should be in charge of a person, preferably one with authority to make adjustments, who is capable of listening attentively and without interrupting the complainant until the complaint is made. Irrespective of how unjustified or senseless the complaint may appear, the complainant should be treated with the utmost of courtesy, and assurance given that the complaint will be adjusted in a manner satisfactory to the customer. Unless the amount involved is large, it is good policy to suffer financial loss, even when satisfied the customer is wrong. The favorable treatment accorded her will be disseminated among her friends, and the returns from same will more than offset the loss of the adjustment.

One important point should be impressed upon employees in connection with service, and that is that the customers are not interested in the troubles of the company in supplying them with ice, and do not care, or want to listen to a long talk as to why they do not get the service they were promised.

**Cost of Service.**—The first unit of expense in delivery service is the haulage of ice from the plant to the sidewalk in front of the customer's house.

The second unit of expense in delivery service is the handling of ice from the wagon to the ice chamber in the customer's ice box and includes a number of operations. The driver, unless he knows the customer's needs, is obliged to make a trip to the ice box before bringing in the ice; the large cakes of ice in the wagon must be cut into the requisite sizes; the ice is carried, as a rule, from sidewalk around to the back porch or kitchen. In many cases the driver is obliged to take food out of the ice cham-

ber and rearrange the old ice in the box to make the fresh piece fit in. He is then obliged to collect cash or coupon for his ice. A great deal of time is consumed in all these operations from the wagon to the ice box, and the driver is usually obliged to make a separate, distinct trip for each piece of ice carried to a customer's ice box.

**Cost of Labor.**—The cost of labor and time involved are the same for each separate 25, 50 or 100-pound piece of ice. If the ice is carried to ice boxes above the first floor it requires proportionately more of the driver's time to make each trip from wagon to ice box and back again. The analysis of the operations involved would show as follows:

The first unit cost of haulage from plant to sidewalk in front of the customer's house is practically the same per 100 pounds to all the customers on any one route. From this point the additional service cost of taking ice to iceboxes varies considerably. The second floor deliveries would probably take 27 per cent more time than the first floor deliveries, and third floor deliveries 50 per cent more time, and so on.

Assuming that the labor and expense of maintaining one horse and wagon, including wages, feed, etc., amount to \$10.00 per day, subtracting one-fifth of the day's expense to cover time consumed from plant to sidewalk would leave \$8.00 daily expense to cover the service from wagon to icebox. Suppose the driver is able to serve 200 first floor customers daily. This would show a cost of four cents to carry each piece from the sidewalk into the customer's icebox. If he carried ice above the first floor, naturally he could not serve so many customers, under ordinary prevailing conditions, and the actual cost of handling each piece above the first floor would be increased.

**Service Costs.**—The table of service costs covering the expense from sidewalk to ice chamber on this basis would show as follows:

**First floor:**

- 100 lbs. at each delivery, 4c per piece; rate, 4c per 100 lbs.
- 50 lbs. at each delivery, 4c per piece; rate, 8c per 100 lbs.
- 25 lbs. at each delivery, 4c per piece; rate, 16c per 100 lbs.

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**Second floor:**

100 lbs. at each delivery, 5c per piece; rate, 5c per 100 lbs.  
50 lbs. at each delivery, 5c per piece; rate, 10c per 100 lbs.  
25 lbs. at each delivery, 5c per piece; rate, 20c per 100 lbs.

**Third floor:**

100 lbs. at each delivery, 6c per piece; rate, 6c per 100 lbs.  
50 lbs. at each delivery, 6c per piece; rate, 12c per 100 lbs.  
25 lbs. at each delivery, 6c per piece; rate, 24c per 100 lbs.

**Fourth floor:**

100 lbs. at each delivery, 7c per piece; rate, 7c per 100 lbs.  
50 lbs. at each delivery, 7c per piece; rate, 14c per 100 lbs.  
25 lbs. at each delivery, 7c per piece; rate, 28c per 100 lbs.

To illustrate the practical application of the foregoing table of service costs: Assuming the expense of manufacture plus expense of haulage to sidewalk to be 50c per 100 pounds, the total cost of a 25-pound piece of ice delivered to the ice chamber on the first floor would be at the rate of 66c per 100 pounds, and if delivered to the fourth floor would cost at the rate of 78c per 100 pounds. In computing selling prices, a reasonable profit would, of course, be added to the manufacture and service costs.

**Disadvantages of Carrying Out Such a Schedule.**—A number of disadvantages would probably be met in carrying out this schedule of charges. If the customer paid cash for each delivery, the driver would have to carry a special table of rates to show the selling price for each piece of ice delivered, and would also have to make a report of each separate sale, so that the office could verify his daily report.

If the customer used coupon books the books would have to be sold from a schedule and the classification shown on the receipt ticket, so that the office could make the correct charge for the book.

Either system would entail a great deal of detail work, and the possibility of many errors and misunderstandings. To make the system workable and correct, the entire delivery system would probably be handled to best advantage with coupon books exclusively and delivered to the customer direct from the office only.

This idea of the separate charge for each unit of service, while new in the ice business, has been used for years in a closely

allied business, that of coal. Coal is sold at the yards or delivered to the curb or driveway. If necessary to carry it into cellar, an additional charge per ton is made, usually based on the distance from curb to coal bin.

While this idea as applied to ice business may seem revolutionary, the gradual installation of the cash and carry stations, and the tendency of the times to make special charges for special services rendered in many lines of business, may possibly see this idea universally applied in the ice business of the future.

## CHAPTER VI.

### SHRINKAGE.

**Shrinkage Mostly an Assumption.**—That great absorbing question—shrinkage. What a lot of discussion it has evoked, and how little has resulted from it! Shrinkage is mostly a matter of supervision. The cutting of the ice and weather conditions are a natural cause for shrinkage, but most of that which is termed shrinkage goes into the driver's pocket.

During the course of a discussion on shrinkage at a meeting of an ice association in New York, the general manager of the largest company in a large eastern city said that no route could be served and give the customers the weight they paid for with less than ten per cent shrinkage. A gentleman who formerly had been actively engaged in a large company, but has since retired, said ten per cent was excessive; that during his time the average shrinkage in his company was four and one-half per cent. Others present also quoted lower shrinkages. The general manager again got up and said, "I still contend that ten per cent should be allowed." The retired gentleman then arose and said, "If Mr. C. would get up at 4 o'clock in the morning and get on the step of one of his wagons and cover a route, putting down the weight of each piece delivered, deducting the weight of the tongs, as I have done, not one morning but many mornings, he would find, as I did, that ten per cent is excessive." One man stated a fact, the other an assumption.

Another incident in connection with shrinkage which occurred in a company in which most of the ice sold by drivers was

for cash. Shortly after the foreman system was installed, a foreman in checking up a route from his route book found a cash delivery of 600 pounds on his book that did not appear on the driver's cash slip. When the driver was asked why he had not entered it, he said he guessed he'd forgotten it. Upon further questioning as to whether he did not know after he had made up his cash that he had \$1.80 more than he should have had, said "No. I keep my money and the company money all together. I wouldn't know about it unless I had been called for a high shrinkage, then I probably would have thought of it." When the clerk who made up the drivers' books was asked as to this driver's shrinkage on that day, he said it was about his usual amount, 12 or 14 per cent. This shrinkage of 12 or 14 per cent was allowed him on the assumption that as that was the amount he usually ran short, it should be allowed him for shrinkage. On the days he filled his butchers' needs, two or three tons each, for which he charged them the amount as shown on the sales ticket, he would be allowed the same shrinkage.

**How Evenly It Can Be Regulated.**—The following table (Table I) giving the average daily sales and the per cent of shrinkage on several routes for two years will illustrate how closely drivers can figure their percentage and how even it runs.

TABLE I.  
AVERAGE DAILY SALES AND PER CENT OF SHRINKAGE ON ROUTES,  
JUNE, JULY, 1918-1919.

	Average Daily Sales		Shrinkage Per Cent	
	1918	1919	1918	1919
Route No. 2				
June .....	6.7	6.2	6.5	6.3
July .....	7.9	6.7	6.9	6.8
Route No. 3				
June .....	4.5	3.3	7.0	7.0
July .....	4.3	2.2	8.4	6.4
Route No. 6				
June .....	4.2	4.4	9.8	8.0
July .....	5.1	4.9	10.0	8.1
Route No. 13				
June .....	4.2	4.1	12.0	13.0
July .....	4.6	4.2	13.0	13.0



## ICE DELIVERY

TABLE I (Continued)

Route No. 19				
June .....	3.6	3.6	9.0	10.0
July .....	3.8	3.6	10.4	10.0
Route No. 22				
June .....	2.4	2.7	8.7	8.0
July .....	3.4	3.1	9.7	8.0

It will be noticed that on Route No. 3, the shrinkage for June, 1918 is the same as for June, 1919, yet there is a difference in the daily average of 1.2 tons. Route No. 6 shows a difference of 2/10 of one per cent between June and July, 1918, and a difference of 1/10 of one per cent in 1919. Route No. 13, June 1919, shows an increase of one per cent over 1918, while in July the shrinkage for that month is the same in 1918 as it is in 1919. Route No. 19 shows the same tonnage for June and July, 1919, and the same shrinkage for those months in 1919. On route No. 22, we have an increase of 4/10 of a ton in July over June, and the shrinkage remains the same for those months.

In a company in the northwest the year following the installation of the foreman system the proper supervision of all routes reduced the shrinkage from 18½ per cent to 5½ per cent. The saving in ice by the decrease in shrinkage of 13 per cent amounted to 160 tons in one week.

As an instance of what decreased shrinkage means in dollars and cents, the week in which the 160 tons were saved, 2,374 more customers were served daily with only one additional man on the wagon. To serve this great increase in customers required 219 tons of ice. As the decrease in shrinkage amounted to 160 tons, the only expense incurred in serving these customers was an average of 10 tons of ice more per day than the previous year, and the wage of one extra man. The net saving amounted to approximately \$100 per day.

In a company in Connecticut, reports for the month of November showed a shrinkage of 50.8 tons. With proper supervision, the report for November of the following year showed a shrinkage of only 2.4 tons. Other figures in the report indicated that the company received money for the ice saved that was charged to shrinkage the previous year.

As an example of what happened when 312 ice drivers were permitted to run seven days continuously without careful check-

ing, 186 of these drivers ran short in ice to the amount of 84,400 pounds. The same number of drivers carefully checked and made to account for the ice charged them for the succeeding seven days actually ran less than 10,000 pounds short.

**Standard Amount Cannot Be Set.**—No standard amount of shrinkage allowance for drivers can be set which is fair to driver, company or customer. Some companies figure up the average shrinkage on all wagons each day, and that average is the standard by which all are gauged. Drivers who serve mostly heavy trade with few customers should have little shrinkage. This tends to reduce the general average. If that average is low the man who serves a residential route with 150 or 250 customers, who take 25 and 50 pounds daily, will tell his customers, who complain of the size of the piece he gives them, that he is forced to give short weight to come within the amount of shrinkage allowed him. Whether such is a fact or not, the customer, whose sympathy is always with the driver, believes him. This puts the onus of giving short weight up to the company.

Another feature of such a method is that drivers who serve heavy trade and who can run a low shrinkage will take advantage of the average method and figure so as to come within it, and pocket the proceeds of the difference between the actual shrinkage and what they report.

A company which sold most of its ice for cash allowed a shrinkage of five per cent on all routes. Drivers claimed it was not enough, and threatened to strike unless it was increased to ten per cent. A careful check of 18 out of 22 routes demonstrated that the increase in shrinkage would only have gone into the drivers' pockets.

**An Individual Proposition.**—Shrinkage allowance is practically an individual proposition, as there are so many conditions to take into consideration, and the person who determines the amount of shrinkage allowance for each driver should be thoroughly familiar with delivery operations and conditions on each route or section in which wagons operate.

Foremen's report cards are of great assistance in determining the amount of shrinkage, as it will be found that on the days routes are written shrinkage will usually be normal, or lower,



than on the days when driver is alone. Exceptions to this rule have been noticed; in fact, drivers have run larger shrinkages when the foreman was on with the driver, but in such cases the customers have been surprised at the size of the piece they received. The foreman who is up to his job will soon get wise to such practice, and when he informs the driver that he will not stand for it that will be sufficient. If foremen permit such practice, inspection of the report cards will make it apparent and, therefore, such men are not competent to hold the position.

Weekly writings of the route by competent foremen who take satisfaction in matching their wits against the drivers', and when irregularities are detected, inform the men that they will not stand for them, will soon reduce shrinkage to a normal basis. This fact has been conclusively proven.

The superintendent's clerk, in checking up the daily report, should note all excessive shrinkage and immediately make out a shrinkage report of all drivers showing excessive shrinkages at each station, and same should be sent to station superintendents, who must make a report on each case at his station. A report of this character is shown in Fig. 7.

## CHAPTER VII.

### ACCOUNTING SYSTEM FOR ICE DELIVERY

**Value of Efficient Accounting.**—Every ice company has some system of accounting, but any business man who looks upon his accounting as mere recording and not as a method of control for the details of his business, misses the vital significance and use of the facts behind the figures.

Many men pay very little attention to the accounting branch of their business, especially the details. The general result apparently is all they are interested in. Yet it is the details that very materially affect the general result.

The knowledge at the end of the year that so many tons of ice have been sold, and so much money received for it, the expenses were so much and the difference is the profit or loss, is of little value.

It may even be possible to tell at the end of the year what it costs per ton to manufacture the ice and what it cost per ton to deliver it. This is simply a general result. It is not possible with such accounting methods to analyze the figures and determine exactly where to look for the defects, which if corrected, will reduce the cost the following year. The man who waits until the end of the year to know what he is doing is making a costly mistake. He should know each day, each week, each month, what he is doing, and what his costs are. He should be able to make comparison with the corresponding period of the previous year in order to know accurately what he is doing, and if he is running behind, to seek the cause at once.

Many owners and managers realize the value of an efficient accounting system, but maintain, however, that to put in a system that will furnish the necessary information will involve a large amount of money to install and maintain, and the expense will far offset the gain. This is an erroneous opinion. An accounting system that is properly constructed, one that avoids duplication, yet is correlated, costs less to maintain than one that is merely a record of transactions.

A company operating 120 peddling wagons, 15 wholesale and supply wagons, serving 25,000 customers and selling from 900 to 1,500 tons of ice daily, has the following employees in its accounting department: Auditor, cost clerk, who handles the coal ledgers; general bookkeeper, bookkeeper, four girls and two boys.

We will not take up the subject of accounting except that part of it which is directly related to the acquiring of information necessary to successfully handle a delivery department.

**System Should Be Correlated.**—An accounting system to be efficient the forms constituting it must be correlated, that is, forms must be related to each other in order that summaries may be quickly obtained with the least amount of work. There may be several sets of forms in an accounting system, but the forms in each set must be related to one another, and the result of each set have its proper relation in the final result. Forms should be devised for the particular needs of the business in which they are to be used; duplication eliminated as much as possible, and the forms so related, especially those dealing with cash transactions, that responsibility for errors can be charged directly to the one accountable for same, and not distributed among several persons.

The system described and illustrated herewith was especially prepared for an ice delivery company. The company was a separate and distinct organization, not connected with the producing companies, except insofar as mutuality of interest was concerned. The company purchased ice from five producing companies. Contracts were entered into with each company for a stipulated amount during the year, with a penalty clause of so much a ton for all tonnage not taken up to the contract amount. The price paid to all was the same. All ice sold at the platform

of the various plants with the exception of cut ice up to 300 pounds was sold for the account of the delivery company up to its contracted amount. This included all ice sold to peddlers, dairymen, ice cream manufacturers, etc., and carload ice.

Previous to the time the delivery company was formed the ice business in the city was badly demoralized. The customers and the drivers set the prices. That is, while there was an established schedule of prices, which had been sanctioned by the Food Administration, the price was cut to some of the heavy commercial trade, and the smaller commercial trade was charged according to the whim of the drivers. Five such customers in one block might be paying five different prices, yet according to the quantity taken all were entitled to the same rate. The lowest commercial cash rate was 30 cents, and as there was no record of the customers on the various routes, the drivers reported all commercial cash ice sold at the minimum rate, 30 cents, whereas most of it was sold at 40 and 50 cents. The rate to family trade was 45 and 50 cents.

The officers of the delivery company decided that as a matter of policy it would be inadvisable to make any radical changes in the manner in which payment for ice should be made, therefore the former method of selling ice for cash, coupons and credit was continued. This policy will explain the necessity of some of the forms which to many may seem unusual or unnecessary. The first change made was to effect rigid conformity to the established prices in connection with the commercial trade, and the giving of the full weight paid for. The weight ticket described and illustrated later on was devised to effect this.

The coupon system is undoubtedly the ideal method of selling ice and mildly coercive efforts were made to induce customers to buy their ice with coupons. To accomplish this, and to make it as easy as possible for all to buy coupons, a strip of coupons was sold for \$1.00, eight 25-pound coupons to the strip. This strip coupon was introduced principally to decrease the cash business among the class of customers who buy 25-pound pieces two or three times a week and do not want to pay out \$4.50 or \$5.00 at one time. This class of trade was paying 15 cents for 25 pounds, or at the rate of 60 cents per hundred. By buying the strip coupon the customer would save 20 cents on each strip. This

feature was advertised extensively, in fact most of the advertising was devoted to exploiting the buying of coupons. Another feature in connection with coupons was the introduction of a book at a special price for small commercial trade. This book was designated by a star and the purchaser would save ten cents a hundred by using it. This book sold well. The introduction of the coupon strips was beneficial but not to a very large extent. Even though a nickel-plated ice pick was given as a premium the people preferred to pay cash for their ice.

As stated above, it was not the policy to arbitrarily force matters, therefore mildly coercive measures were used, and the introduction of the coupon strips, star books and weight tickets decreased the cash business very nearly twenty per cent.

The drivers sold all classes of coupon books and strips strictly for cash. Each driver was given his coupon pouch in the morning, for which he signed, and in the evening he returned the money for all books and strips sold. If a driver left a book for which the customer did not pay, he did so solely on his own responsibility and had to pay for it that night out of his own money. For customers who wanted books on credit he was furnished cards, which the customer had to fill out and sign. These cards he turned in, and if the customer's rating was good the book was delivered from the office. In this connection it was found that very few of these cards were turned in, as the drivers, when customers said they did not want to pay for the book at the time, would reply that the only books he had were cash books and would try to get cash, rather than to explain about the credit card. Eighty per cent of the coupon books and strips were sold for cash.

**System Described.**—In order to show as nearly as possible, in a descriptive way, the correlation of the forms of the system and to follow the delivery of the ice and handling of the records in connection with its sale, we will follow the system through from the time the ice is loaded on the wagons. As stated above, ice was purchased from five companies, and at four of the plants the wagons were loaded and went directly from the plant to the route. Ice was relayed from the various plants by trucks to the route wagons. This ice had to be credited to the respective plants



and charged to the various routes and other purchasers. This arrangement necessitated accurate accounting of the purchase and distribution of all ice obtained each day, and we will commence the description of the system with the form dealing with the purchase and distribution of the ice. Following this will be the description of the forms recording the issuing and sale of coupons, and other forms in connection with the delivery of ice. Each driver has two coupon pouches, used alternately. While one is in use the other is being checked up and refilled.

**Daily Ice Purchase Record.**—This form (Fig. 8) contains a column for each plant; ice returned by wagons and return ice taken out by wagons; columns for total amount of ice charged to route wagons, wholesale sales and platform sales. The wagons loaded at the various plants, receiving a ticket for each load which the drivers turned in each night; the plants also furnished a duplicate ticket. The amounts as shown by these tickets were credited to each plant, and the total, less the return, was charged to the respective routes. The number of each route and the driver's name is entered on the sheet. All sales made at the various plants for the account of the delivery company are also entered on this sheet. These amounts are credited to the plants and charged in the wholesale and platform columns. This sheet therefore contains a complete record of all ice purchased each day and its distribution. The sheet is balanced each day, and when in balance shows that all ice purchased has been properly accounted for. The entries on this sheet are checked against the statements from the plants and then posted to the account of each in the ledger. All other entries are also posted to the various accounts. The amounts charged to routes are entered on the daily sales report, described later, against the respective route wagons. The sheet is then filed in a post binder.

**Driver's Coupon Record.**—This is a record of the coupon books and strips contained in the driver's pouch. The clerk when filling pouches makes up his assortment for each driver and enters upon this sheet (Fig. 9) the date issued, serial letter and the number of each book or strip. The coupon books and strips are then put in the pouch. Each day the receipts re-





turned by the drivers of books sold are checked upon this record and the date of sale entered in the proper column. Each month, at the time inventory of coupons is taken, the contents of each pouch are checked against the list.

Form 134-17-10-12

STATION TP DRIVER'S COUPON RECORD ROUTE No. 8

DATE	Sale	NUMBER	DATE	Sale	NUMBER	DATE	Sale	NUMBER
8/6	A	127	8/6					
8/6		77	8/6					
8/6		78	8/6					
8/6		79	8/6					
8/6		80	8/6					
8/6	B	145	8/6					
8/6		51	8/6					
8/6		52	8/6					
8/6		53	8/6					
8/6		54	8/6					
8/6	D	103	8/6					
8/6		27	8/6					
8/6		28	8/6					
8/6		29	8/6					
8/6	E	204	8/6					
8/6		5	8/6					
8/6		116	8/6					
8/6		117	8/6					
8/6		118	8/6					

FIG. 9.—DRIVER'S COUPON RECORD

**Driver's Coupon Book Account.**—This form (Fig. 10) contains a record of the number of books and strips of each series in the possession of the driver. This information is ob-

Form 134-17-10-13

DRIVERS COUPON BOOK ACCOUNT

STATION TP MONTH Aug '14 ROUTE No. 10

DATE		A	B	C	D	E	S	★	VALUE	AMT. DUE	RECEIVED BY
8/6	Issued	6		5	3	3	3	✓	10.50		W. Smith
8/6	Returned	1		4	3	3	3		9.00	31.50	E. Davis
	Issued										
	Returned										

FIG. 10.—DRIVER'S COUPON BOOK ACCOUNT

tained from the contents of the driver's pouch. The number of each class of books is entered in the respective columns, and the total value of all books and strips is entered in the value column. When the pouch is given to the driver he signs for same in the column "Received by." When the driver returns

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his pouch at the end of the day the clerk enters in the respective columns on the line designated "Returned" the number of books and strips of each class it contains. The value of the returns is entered in value column and the difference is the amount due, and is entered in its proper column. This is the amount the driver must turn in to the clerk, who then signs for the same in column "Received by." This clears the driver of all responsibility for the contents of the pouch. If a book or pouch is stolen or lost, reference to the "Driver's Coupon Record"

FORM-W.	
Route No. _____	Book No _____
Received of _____	_____ 19
<b>CITY DELIVERY CO.</b>	
_____ Lbs. Ice	
CHARGE OUR ACCT.	AMOUNT PAID
_____	\$ _____
Received by _____	
FOR CUSTOMER.	FOR CITY DELIVERY CO.
<small>UNREGISTERED UNDER PATENTS NOV. 4, 1903, MAY 24, 1904, OTHER PATENTS PENDING. AMERICAN SALES BOOK CO., LITTON, NIAGARA FALLS, N. Y.</small>	

FIG. 11.—WEIGHT TICKET

will immediately supply the number or numbers, and all drivers notified to be on the lookout for such numbers, and report the same to office if any of the coupons are tendered for ice. Each sheet is ruled on both sides, affording a sufficient number of lines for one month's usage, and each route has its individual sheet.

**Coupons.**—Coupons were sold in book form and strips. Books for domestic trade, series A, were made up of 25-pound coupons, 1,000 and 2,000 pounds to the book. Books for commercial trade, series D and star, were made in three sizes, 2,000, 3,000 and 6,000 pounds to a book. The 2,000-pound book was a special book containing only coupons of 100 pounds each. A large red star was printed on the cover and on each coupon, and

it was sold with the distinct understanding that no deliveries less than 100 pounds would be made to the purchaser, and it would not be accepted for ice delivered to residences. This book was sold at \$8 and was introduced to decrease the cash business among the small commercial trade. The 3,000 and 6,000 pound books contained only 300-pound coupons, and were sold only to customers who purchased 300 pounds or more at one delivery. The strip coupon contained eight 25-pound coupons and was sold at \$1. The reason for their introduction has been referred to above. The E and S series of books were some that had been used by one of the companies and were discarded as soon as the supply on hand was used up.

<b>CITY DELIVERY COMPANY.</b> <b>ORDER FOR CHARGE COUPON BOOK</b>	
<i>Route No.</i> _____	<i>Date</i> _____
<i>Deliver to</i> _____	
<i>Address</i> _____	
_____ <i>Coupon Books of</i> _____ <i>pounds</i> _____ <i>lb. coupons</i>	
<i>and charge to my account.</i>	
<i>Signed</i> _____	
_____	
<small>Form 35 2-3-10-2M</small>	

FIG. 12.—ORDER FOR CHARGE COUPON BOOK

**Weight Ticket.**—This ticket (Fig. 11) is used for weight, or commercial trade, both cash and credit. It is made up in books of 50 sets in duplicate, white and yellow tickets, the white ticket printed on carbonized paper and attached permanently in the book, the yellow ticket detachable. Each book has a book number and is left with the customer. The book number is recorded in the office and all re-issues bear the same number. Tickets are numbered consecutively. The book number is entered on the ledger sheet of all credit customers. This is a safeguard in preventing such customers from being charged with ice delivered to some one else. When ice is delivered to credit customers the customer or his representative signs for amount re-

ceived. Ice delivered for cash the driver receipts for amount of money received. Owing to the entries on yellow sheet being from the carbonized paper, any alterations or erasures are very

<b>CITY DELIVERY CO.</b>	
<b>Route No.</b>	<b>Ticket No.</b>
<b>Driver's Ticket</b>	
<b>1001</b>	
<i>Delivered to</i> _____	
<i>Address</i> _____	
<i>_____ pounds of Ice for which no Money, Coupon or Weight Ticket was received.</i>	
<i>Date</i> _____	<i>Driver</i> _____
<b>Leave attached ticket when delivery is made. Place this ticket in envelope for credit in ice.</b>	
.....	
<b>CITY DELIVERY CO.</b>	
<b>Date</b>	<b>Ticket No.</b>
<b>Driver's Ticket</b>	
<b>1001</b>	
<i>Delivered to you today</i> _____ <i>pounds of Ice for which no Money, Coupon or Weight Ticket was received.</i>	
<i>Driver</i> _____	
<b>Do not pay for amount of ice stated above only on presentation of yellow ticket bearing same number.</b>	
<b>CITY DELIVERY CO.</b>	

FIG. 13.—DRIVER'S TICKET

noticeable. In the case of cash trade, the rate they pay is entered in the record book against the record number, making it a simple matter to check up the cash trade.

**Charge Coupon Books.**—The form used for customers who desire credit is shown in Fig. 12. It is printed on cardboard of a size to fit in the driver's coupon pouch. When properly

filled out it is returned to the office by the driver, passed on to the credit man for investigation and if approved, signed by him and the book delivered direct from the office.

Drivers are very apt in making excuses for differences in amount of ice reported and that taken out. One of the most familiar is inability to obtain coupons from customers not at home and failure to obtain weight tickets. The form shown in Fig. 13 was especially provided to overcome any excuse in that connection. Its use makes it possible for the driver to account for every pound of ice delivered.

**Driver's Ticket.**—This ticket (Fig. 13) is in four parts made up in books of 50 sets, enclosed in a binder. It is used in all cases where money, coupons, or weight tickets are not received by the driver. Tickets are made in two colors, white and yellow, and each of the four tickets bears the same number. The white ticket is of carbonized paper, so that entries made on the white tickets are duplicated on the yellow ticket. When delivery is made the lower half of the white ticket is left with the customer, the upper half is returned to office for credit in ice and filing. The yellow tickets remain in book until payment is made. When payment is made, the lower half of the yellow ticket is given to the customer and the upper half, together with coupon, weight ticket, or money, is turned in to offset charge against driver. When yellow ticket is returned, it and the white ticket of corresponding number are destroyed, and the transaction is closed. The use of this ticket makes it possible for drivers to account for all ice delivered; eliminate excuses for shortage, and prevent disputes between drivers and customers

**Delivery Ticket.**—This form (Fig. 14) is made in duplicate, numbered consecutively and bound in book form, 50 sets to a book, two color tickets, white ticket on carbonized paper. This is a combination ticket used in the delivery of ice by trucks to route wagons and also to heavy weight trade. In the delivery of ice to route wagons the white ticket is signed by the driver and retained, to be turned in at the end of the day's work. In delivery to heavy weight trade it is signed by the customer, who retains the white ticket to check up with the bill. The yellow tickets are turned in by the truck driver each night. The carbonized



paper also makes alterations or erasures very easily noticeable.

**Truck Report.**—See Chapter X, "Use of Motor Trucks in Ice Delivery."

**Writing, or Checking Routes.**—There is no use of writing, or checking a route, as it is more generally termed, simply to create in the driver's mind the idea that he is being checked. That does not bother him; he can provide for any irregularities on his route the day the foreman is with him and take care of his customers properly on that day. But with a report such as illustrated it is possible, by comparison, to detect irregularities on days when he is alone.

CITY DELIVERY CO. DELIVERY TICKET	
Truck No. ....	
Wagon No. ....	Date .....
Received of CITY DELIVERY CO. <span style="float: right;">4</span>	
..... blocks ..... pounds of ice	
Signed .....	
Address .....	Route No. ....
Time Received .....	

FIG. 14.—DELIVERY TICKET

Compilation and comparison of the reports will disclose many facts of importance: such as actual time employed in serving the route, which, compared with reports of routes similar in character of trade served, tonnage handled, customers, etc., is of much value in determining the ability of drivers. Also difference, when unaccompanied, in time taken in serving the route, shortage, amount of cash ice accounted for, etc. The record of total number of customers shows whether the route is increasing or decreasing, and in what particular class of trade loss or gain is made. It possesses other features of value.

**Route Book.**—This book is used in writing or checking the routes by the foremen. Many companies use an ordinary pass

book for this purpose, but when books are purchased in quantities of 500 or more it will be found that one devised for the particular purpose can be bought as cheap or cheaper than the pass book. With a book such as the one here illustrated (Fig. 15) information that is valuable can be obtained in a form that

ROUTE No. _____ DRIVER _____		
NAME	No.	STREET

FIG. 15—LEFT-HAND PAGE FOREMAN'S ROUTE BOOK

DATE _____				DATE _____			
HOW TAKING	POUNDS	CASH	COUPON NUMBER	TIME	POUNDS	CASH	COUPON NUMBER

FIG. 15A—RIGHT-HAND PAGE FOREMAN'S ROUTE BOOK

makes it very easy to check up. In using this book the foreman enters the name of the customer, when it is possible to obtain it without delaying the driver, number of the house, and name of street. Opposite this is entered how the ice is bought, whether by coupon (Cp), cash (C), weight ticket (W), or drop ice (D).

Drop ice is ice that is left on sidewalk or delivered to janitors of office buildings, banks and stores, and is billed monthly at a certain rate per month. In the next column is the amount of pounds delivered. If a cash customer, the amount of cash collected is entered in the cash column, and if a coupon customer, the number of the coupon in the coupon column. When the first delivery is made the time is entered in the time column, opposite the name of the customer. The time is entered at intervals of about every half hour opposite the name of the customer served at that time. This feature makes it possible to obtain an idea of how long it takes a driver to serve a certain number of customers, and the tonnage delivered; also makes it possible to go out and pick up a driver at almost any time of the day without loss of time driving all over the route. In the absence of the driver, and the foreman is serving the route, it is of value as a guide in serving the route as near the regular time as possible. The entries in the book are made exactly as the route is served. The book is devised for two writings. It is advisable to leave one or two lines between each entry to insert names of new customers on the second writing. Having the number of the coupon entered in this book has several features. Tracing of lost or stolen coupon books; the use of specially priced coupons at places other than those designated; the interchange of loose coupons between drivers.

Writing each route weekly, or at least twice a month, is one of the most effective methods of obtaining control of drivers, as it makes it a simple matter for the foreman to take new men and by the aid of the route book teach them the route in a very short time, and maintain regular service. The writing of routes also serves as a connecting link between the customer and the company, and tends to impress upon the customers the fact that the company is looking after their interests as well as its own.

**Foreman's Daily Report.**—This form (Fig. 16) is printed on cardboard and furnishes a complete report of that particular route. All entries are made by the foreman. Most of the information on this card is obtained from the Route Book (Fig. 15). On the face of the card in lower section, in the column "Served Today," is entered the number of customers of each class that actually received ice that day. On the reverse side (Fig. 16a),

<h2 style="margin: 0;">FOREMAN'S DAILY REPORT</h2> <h3 style="margin: 0;">CITY DELIVERY CO.</h3>						
Route No. <u>5</u>		Date <u>8/16/19</u>				
Wagon No. <u>5</u>		Temp. _____				
Driver <u>W. McBarn</u>						
Helper <u>B. Twilley</u>						
" _____						
TIME						
Pounds Chgd.	<u>10200</u>	Weighed Out	<u>6.15 a.m.</u>			
Pounds Reptd.	<u>10090</u>	Com. Delivery	<u>6.30 .</u>			
Loss or Gain	<u>110</u>	Fin. Delivery	<u>2.30 p.m.</u>			
Total Cash	\$ <u>2800</u>	Weighted In	<u>3.15 "</u>			
		Elapsed Time	<u>9 hrs.</u>			
CUSTOMERS	SERVED TODAY	POUNDS				CASH REPORTED
Coupon	74	3	6	0	0	
Cash—Domestic	107	4	6	9	0	23 45
Cash—Weight	4	1	3	0	0	4 55
Weight	1			7	5	
Drop	1			5	0	
Driver's Tickets	7		3	7	5	
<b>TOTAL</b>	<u>194</u>	1	0	0	90	28 00

FIG. 16.—FOREMAN'S DAILY REPORT

## ICE DELIVERY

TIME	WEIGHT	POUNDS	
6 15	4500	10200	Charged
9.00	4200	10090	Reported
1 00	1500	110	Difference
		-	Returned
		110	Loss
		01	Per Cent

## TOTAL NUMBER OF CUSTOMERS

	COUPON	CASH ICE		WEIGHT	DROP	TOTAL
		DOM	COM			
This Writing	104	195	4	1	1	305
Previous Writing	92	170	8	2	1	273

Customers Discontinued \_\_\_\_\_

Loss or Gain

Customers, New

12

32

## REMARKS:

*Six commercial customers  
bought coupon books*

*T. J. McLeary*

Foreman

FIG. 16A.—FOREMAN'S DAILY REPORT

# ACCOUNTING SYSTEM FOR ICE DELIVERY

99

Total Charged 14900 lbs.  
 Total Reported 14550 "  
 Difference -350 "

Route No. 10 Date 8/16/19  
 Driver Jos. Taylor  
 Helper Mr. Watson

## CITY DELIVERY CO.

DETAILS TO BE FILLED IN AT MAIN OFFICE							
SERIES	No. of Coupons	Lbs. Per Coupon	TOTAL POUNDS			@	VALUE
A	144		3	6	0	0	16 20
B	10			2	5	0	1 25
C							
D				6	0	0	2 10
E							
S							
★	11		1	1	0	0	4 40
TOTAL			5	5	5	0	23 95
Cash Ice (Domestic)				6	8	0	34 00
Cash Ice (Weight)				2	2	0	7 20
TOTAL			1	4	5	5	65 15
Weight Tickets							
Drivers Tickets							
Drop Ice							
TOTAL			1	4	5	5	65 15
Average Price Received Per 100 Lbs. <u>44.8</u> Cts.							

FIG. 17.—FRONT OF DRIVER'S ENVELOPE

in the section designated "Total Number of Customers" is entered the total number of customers of each class on the route, irrespective of whether they were served that day or not. The information for the second line, "Previous Writing," can be obtained from the previous report cards. On the line "Weighed Out" is entered the time the wagon leaves the station; on the next line is the time when the first delivery is made; the time that the last delivery is made is entered on the next line, and the time the wagon returns to the station on the next. The time between "Weighed Out" and "Weighed In" is the "Elapsed Time." The amount for "Pounds Charged" is obtained from the driver's tickets or from Form 1. "Amount Reported" is obtained from the "Route Book," the difference is the "Loss or Gain," and the total cash is the amount as shown by the "Route Book." The number of customers under the various classifications is obtained from the column "How Taking" in the "Route Book." Time and weight of loads should be entered each time ice is obtained. The pounds column is a summary of the total tonnage. Under "Remarks" should be given information concerning loss of customers, or any other information of value in connection with the route.

The use of such a report is of great value to the superintendent of delivery in checking up drivers' work on days when foremen are not with them. If a driver can serve a route and get in within a reasonable time, and with a proper shrinkage on days when a foreman is with him, it is logical to assume he can do so on other days during the week, other conditions being equal. The elapsed time, time consumed in disposing of load, class and number of customers served is of much value in combating claims for more help or that route is too big.

**Driver's Envelope.**—In this envelope (Fig. 17) the driver makes his returns of coupons, coupon receipts, weight tickets, and driver's tickets at the completion of the day's work. On the face of the envelope he fills in the date, route number, name of driver and helper. The other entries are filled in at the office when the coupons are counted. On the reverse side (Fig. 17a) he enters the number of books and strips sold and amount collected; the amount of money collected for domestic cash ice

**Driver's Daily Cash Statement**

Date 8/16/19

The following described sales and amounts of money collected were made by me today for the CITY DELIVERY CO.

	Number SOLD	Amount Collected
Coupon Books	2	9 00
Coupon Strips	2	2 00
Cash Ice (Domestic)		34 00
Cash Ice (Weight)	<sup>100%</sup> 37 1/2 55	7 20
<b>TOTAL</b>		<b>52 20</b>

Signed Joe Taylor Driver

Received by F. Bair  
For City Delivery Co.

FIG. 17A.—BACK OF DRIVER'S ENVELOPE



and the weight and amount of money collected for weight or commercial ice, and totals same, signs his name and turns money and envelope over to the clerk, who checks it up and if correct, signs his name. When the clerk accepts the envelope and money and signs his name, the driver is cleared.

**Daily Record of Driver's Cash Sales.**—This form (Fig. 18) contains a record of the total cash transactions of each route. The information for the various columns under Coupon Book Sales is obtained from the "Driver's Coupon Book Account" (Fig. 10), and for the columns under Cash Ice Sales from the back of the "Driver's Envelope" (Fig. 17a). At the same time the entries of cash ice sales are made the entries as to coupon book sales previously entered from form shown in Fig. 10 can be verified. The amount of the platform sales is obtained from the "Ice Purchase Record" (Fig. 8). This entry is made to show the complete amount of cash sales at each station for the day.

**Station Daily Cash Receipts.**—On this report (Fig. 19) are assembled the total amounts of cash received at each station daily. The figures for this report are obtained from the "Daily Record of Driver's Cash Sales" (Fig. 18). This report is made in duplicate and signed by the station clerk. It is sent to the cashier at the main office with the money. The cashier checks it up and if correct signs his name and returns the other to the station clerk. When this form is signed by the cashier it clears the station clerk of all responsibility for errors.

Much money can be lost in the beginning and close of each season in the splitting and doubling up of route wagons. In many cases this is done mostly by rule of thumb methods, whereas it should be done just as systematically and methodically as any other branch of the work is done.

In the spring it is sometimes expedient to put on additional wagons even though the tonnage sold does not warrant them. At this period of the year additional business can be expected, and it is necessary to be prepared to take care of it. As the season draws to a close is the time that advantage must be taken of the information pertaining to route conditions if that which has been gained during the peak period is not lost. It is surprising how quickly the cost per ton will increase at this period of the year.



















In this connection the form shown in Fig. 20 is invaluable to the manager or superintendent. It not only gives him the necessary details in connection with each route wagon, but also a daily complete statement of the accumulated sales of each class, with the average price received per ton, and the total amount of all sales to date, and price received. Transference of these figures daily to a separate sheet for each route will furnish a complete record of sales made, income received and wage cost per ton on every route for the year. With such information at hand the splitting up and doubling up of routes can be accomplished in such manner that tonnage handled per man will not be decreased very perceptibly and yet the same service maintained.

**Daily Sales Report.**—This form (Fig. 20) contains a complete statement of the total sales for the day, and accumulated sales to date. In the body of the report the various amounts are stated in pounds. In the upper portion the amounts are given in tons. In the section to the left in the upper portion is shown the total tons delivered by route wagons, average tonnage handled per man for the day, and the wage cost per ton. The total number of men on wagons for the day, accumulated number of men, and the total number of men to date. In the next section are shown the accumulated figures to date. The total number of tons delivered on routes, divided by the total number of men, gives the average tons handled per day per man. Total wages divided by total tons gives the wage per ton, and total sales divided by total tons gives the average price per ton. The details in connection with the routes in the body of the report are obtained from the drivers' envelopes (Figs. 17 and 17a). Figures for the wholesale, platform, carload, and car icing sales are obtained from the "Purchase Record" (Fig. 8). The figures for the number of customers on each route are obtained from the "Foreman's Reports" (Figs. 16 and 16a).

It will be noticed that route number one shows 6,630 pounds over. This is accounted for by the fact that on the previous day he had made a delivery of 7,000 pounds and failed to return the ticket for that amount in on the day the delivery was made, making him 7,000 pounds short on the report for that day. He turned the ticket in the day following, which accounts for the

## ICE DELIVERY

large amount over on this report. As this was the first year the company was in operation there were no figures available to fill in the section for the corresponding period of the previous year.

Form 9-C-2-4-19-1M.					
Route No. _____			Book No. _____		
Name _____					
No. _____					St. _____
Business _____			Terms _____		
1		19		37	
2		20		38	
3		21		39	
4		22		40	
5		23		41	
6		24		42	
7		25		43	
8		26		44	
9		27		45	
10		28		46	
11		29		47	
12		30		48	
13		31		49	
14		32		50	
15		33			
16		34			
17		35			
18		36			

FIG. 23.—WEIGHT TICKET ENVELOPE

**Coupon Book Register.**—Upon this form (Fig. 21) is entered the sale of every coupon book and strip. The entries are made from the coupon book receipts and the heading of the coupon strips. At the top of each sheet is entered the serial letter and in the number column the coupon numbers are en-

tered consecutively with a numbering machine as issued. When the receipts come in the date of sale, purchaser's name, and route number are entered opposite the proper number, those sold for cash in the cash column and those sold for credit in the credit column. The totals of these two columns will give the proportion that each class of trade bears to the total sales. If a number remains open after the others are filled it is a simple matter to trace the book or strip through the "Driver's Coupon Record."

**Sales Ledger Sheet.**—This sheet (Fig. 22) is used for keeping a record of all credit sales of ice made other than by coupons. This includes wholesale, platform, carload and commercial trade. Each sheet will record the transactions of an entire year. Upon the upper half of the sheet are recorded the individual charges and on the lower portion are entered the debits and credits. There is sufficient space in the debit and credit section to allow weekly entries for the entire year. At the top of the sheet is entered the name, address, route number, rate, book number and terms. The class of trade is designated on the rate line by letter. When used in connection with the commercial trade the weight ticket is the source of entry. The amount shown on the tickets is entered on the respective date line in the pounds column, and the ticket number in the column designated. Wholesale, platform and carload charges are entered from the "Daily Ice Purchase Record" (Fig. 8). Each week or each month, as the term of payment may be, the total amount of the period in pounds and money is entered on the debit side. When payments are made they are entered on the credit side. The balance column shows the amount due at any period.

**Weight Ticket Envelope.**—This envelope (Fig. 23) is used to file the weight tickets after they are entered in the ledger. Or, they can be placed in the envelope until a certain time and all the tickets entered at one time. The filing of the tickets in such form is of great value in case of disputes when bill is presented.

**Coupon Ledger Card.**—This form (Fig. 24) is used to record all sales of coupons made on credit. It is ruled on both sides. The top of the card contains space for name, address,



CASHIER'S DAILY STATEMENT									
STATION <u>6</u>		DATE <u>8/4/19</u>		CASHIER <u>Smith</u>					
CLASSIFICATION	Domestic Rate	Commercial Rate	Wholesale Rate	Pay Rate	COUPON	Accounts Receivable Coupons	Y	TOTAL RECEIVED	
Coupon Book Sales (Office)									
Coupon Book Sales (Wagon)					490 -			490 -	
Coupon Book Sales (Collectors)					7258			7258	
Couple Strip Sales (Office)									
Coupon Strip Sales (Wagon)					26 -			26 -	
Coupon Strip Sales (Collectors)									
Driver's Cash Sales	4786	9956						57385	
Box Sales (Office)									
Box Sales (Station.....)									
Drivers Tickets	435							435	
Wholesale Sales			6330					6330	
Platform Sales				19990				19990	
Accounts Receivable:									
Office						396505		396505	
Collector						4800		4800	
TOTAL	4786	9956	6330	19990	5886	4800	396505	544295	

FIG. 26.—CASHIER'S DAILY STATEMENT

## ICE DELIVERY

Cash turned in by drivers on "Drivers' Tickets" in the column designated "D. T."

**Cashier's Daily Statement.**—This report (Fig. 26) contains a complete statement of the total amount of money received

<p>○ WHEN PAYMENT IS MADE BY CHECK PLEASE DETACH AND MAIL STUB ONLY ○</p> <p><b>CITY DELIVERY CO.</b></p>			
NO. _____			
NAME _____			
ADDRESS _____			
ROUTE NO. _____	ACCOUNT _____	AMOUNT \$ _____	
BRING THIS BILL WITH YOU WHEN PAYING ACCOUNT AT MAIN OFFICE			
ROUTE NO. _____ ACCOUNT _____			
NAME _____		NO. _____	
ADDRESS _____			
<b>To CITY DELIVERY CO., Dr.</b>			
<b>ALL COMPLAINTS AND ERRORS PROMPTLY ATTENDED TO IF REPORTED AT OFFICE</b>			
	TO BALANCE		
	ICE COUPON BOOK NO.		
RECEIVED PAYMENT			
DATE _____			
FOR CITY DELIVERY COMPANY			

FIG. 27.—BILL FORM

from all sources daily. The figures for the various amounts are obtained from the "Station Daily Cash Receipts" report (Fig. 19) and the "Daily Collection Statement" form (Fig. 25). All amounts received for the sale of ice for cash are entered under

the respective classifications in the column designated. All cash received on credit accounts is entered in the two columns under the heading "Accounts Receivable." The amount of the "Total Received" column is the amount deposited in the bank each day and is checked up against the deposit slip.

**Bill Form.**—The bill forms are printed in two colors, one for coupon credit accounts on yellow paper and one for the other classes of credit sales on white paper. The form of bill used for coupon trade is illustrated in Fig. 27. The only change in the other bill is on the second line where the word ice is used in place of ice coupon book number. The form is punched for a ring binder. The upper portion is easily detachable by reason

NAME			ROUTE NO.		CARD NO.	
			COUPON	WEIGHT	CASH	CREDIT
ADDRESS			FLOOR	FLAT	TEL. NO.	
			FLOOR	FLAT	TEL. NO.	
ADDRESS			FLOOR	FLAT	TEL. NO.	
REASON FOR DISCONTINUING			COMMENCED		DISCONTINUED	
NOW SERVED BY			RATING		CR. ALLOW.	
COMPLAINTS:	MISSED	WEIGHT	SERVICE	GENERAL		
REMARKS:						

FIG. 28.—CUSTOMER'S RECORD CARD

of being perforated just below the line containing route number, account and amount. When payment is made by check it is only necessary to mail the upper portion. This saves time and expense of mailing receipt back; the canceled check is a receipt. When payment is made to collector or at office the lower part is returned to customer and the stub is a record of the collection.

**Customer's Record Card.**—A record of each customer's business is a good thing to have. Whether it is worth the expense of maintaining is a matter of opinion. The form shown in Fig. 28 is devised for that purpose. The information for the face of the card (4"x6") is obtained from several sources:



## ICE DELIVERY

The "Route Book," credit men, and complaint department. The reverse side of the card (Fig. 28a) contains a record of the ice

[illegible]

**FIG. 28A.—BACK OF CUSTOMER'S RECORD CARD**

bought, both by coupon and weight customers. When routes are written the coupon numbers are checked from the "Route Book." These cards should be kept in the files in the order in which the route is served to facilitate checking. This order can be obtained from the "Route Book."

**Coupon Liability Record.**—An ordinary columnar ruled book is used for the purpose of keeping a record of the Coupon Liability Account. One side of the page is used for coupon books sold, and the other for coupons redeemed. The total amount in pounds sold of each series entered in the respective columns on the credit side each day, and the total amount redeemed each day of each series in the respective columns on the debit side. The various columns are footed up each month and the difference between amounts sold and redeemed is the outstanding coupon liability.

**Reports and the Necessity of Analyzing Them.**—An accounting system, however, which is composed of a number of forms devised solely to record transactions has very little value except as a record.

Figures relate to facts, and unless the facts concerning the operations of a business can be readily assembled in such form as to provide a base of control for its operations, figures do not mean anything, except in a general way. It is the facts disclosed by the figures that are essential to efficient operations.

Figures to disclose facts are assembled in the form of statements or reports; they must be placed in such form as to reveal specific information concerning various features of operation.

In order that figures may readily be assembled in the form of reports the various forms comprising an accounting system must be correlated. That is, each form must bear some relation to every other form of which it is a component part. It is in the accumulation of figures, carrying them out into further detail, and comparison with figures of similar operations for corresponding periods, that the full value of accounting is obtained.

One other thing is necessary to derive benefit from accounting, and that is the analyzing of reports. A properly prepared report is not merely a mass of figures to be cursorily glanced at. It is a condensed treatise on and barometer of the operations of a business, and if analyzed and compared with similar reports, will disclose information of inestimable value to the manager and superintendent of delivery.

**Essential Reports.**—The Weekly Comparative Statement, shown in Fig. 4, Chapter III, gives a complete statement of the

total tonnage handled at the various stations. It is made up from the Daily Sales Report (Fig. 20).

A daily report is necessary, but its value is necessarily limited to one day's results, as the days of the week and temperature changes cause variation in sales, tonnage and shrinkage. For comparative purposes a weekly report is absolutely essential as it gives cumulative results for a certain period, thereby permitting the working out of averages. Copies of the weekly statement should be sent to each station superintendent, as it not only shows the results obtained by him but also the other superintendents, and tends to create rivalry.

To give a better illustration of this form it has been filled out with actual figures taken from the original report. At stations "C" and "M," located in the business section of the city, the deliveries are classified as routes and wholesale. Ice delivered in load lots to creameries, ice cream dealers, butcher boxes and car icing is termed wholesale. The tonnage per man is the average daily tonnage; the number of men shown is cumulative for the week. Station "N" was a new station, consequently no figures were available for the preceding year.

The Daily Labor Report, shown in Fig. 3, Chapter III, is principally for the general manager, but a copy should be furnished the superintendent of delivery. It is made up from the daily report and the foreman's daily time reports. It gives the results in concise form of the tonnage and number of men in the various positions at each station. Under remarks, details as to what particular work all miscellaneous labor was engaged in should be given. This form has been found valuable in decreasing the expense charged to miscellaneous labor.

The Route Record, shown in Fig. 29, provides an individual record of each route. Many undoubtedly will consider such a record as absolutely a waste of time and money. If such a record is kept it will open the eyes of a great many men who think they know something about their business. The time to prepare for the future is the present. The future means an eight-hour day with an increased wage. The best way to provide against both is to have accurate data on the returns derived from each producer employed. The non-producer, or indirect labor, is an overhead charge and of a class that usually does not demand





things. The producer is never satisfied. He is always clamoring for more and is supported by his union in his demands. The payment of a bonus or commission on sales is becoming more generally used each year, and unless accurate data is at hand concerning each individual route it is impossible to devise a bonus or commission plan equitable to employer and employee alike.

With all information concerning each route in such a concise form, it is possible not only to devise a bonus system that will be practical and equitable, but the manager can keep himself informed as to what each driver is doing as accurately as though he was actually driven over the route.

The form here shown (Fig. 29), which simply entails the transfer of the figures from the daily report and the footing up of same each week with a few extra calculations and transference to columns at top of page, furnishes accurate data. Its value from week to week, month to month, etc., for comparative purposes, as an absolute record of the value of each route, when it was put on and taken off, and what it was doing at those times is invaluable. It is also valuable in the re-employment of drivers, and as a guide in promoting drivers to the position of foreman.

In using this form the figures for total sales, total wages, price per ton, etc., in the box at top of page are the totals for the month. These figures can be accumulated when the wagon is taken off or brought forward from month to month and entered in red ink on the lines designated. Date written and number of customers should be taken from the foremen's daily report each time route is written.

As an illustration of the information that can be obtained from such a record and its practical value several reports made from such a record are shown.

In Table No. 2 is shown the record of a route in the central district of the city, serving mostly commercial trade. It also had a large number of "drop ice" customers (banks, office buildings and business places). The statement as shown is made up in four week periods, and shows the total tonnage handled, sales value of same, average price received per ton for each week of the period, total number of men, total wages, wage cost per ton, and tons handled per man. The footing shows the totals and general averages for the twenty-four week period.

## ICE DELIVERY

In Table No. 3 is a similar record of a route serving a purely residential district. By comparison it will be seen that while there is a difference of only \$0.61 in wage cost per ton, there is a difference in income per ton of \$1.29, which fact indicates very clearly that drivers handling commercial trade have to maintain a much larger tonnage per man to offset the

TABLE II.—ROUTE RECORD

ROUTE RECORD.							
Route No. 1.		From April 28 to October 11, 1919.					
Period	Total Tons	Sales Value	Price Per Ton	No. of Men	Total Wages	Wage Per Ton	Tons Per Man
10/ 5—10/11/19 ....	59.7		\$7.69			\$0.86	4.3
9/28—10/ 4/19 ....	63.9		7.60			.66	5.3
9/21— 9/27/19 ....	53.1		7.86			.96	3.8
9/14— 9/20/19 ....	66.8		7.64			.77	4.7
Total for period....	243.5	\$1,873.30	\$7.69	54	\$195.00	\$0.80	4.5
9/ 7— 9/13/19 ....	65.9		\$7.62			\$0.79	4.7
8/31— 9/ 6/19 ....	59.5		7.67			.87	4.2
8/24— 8/30/19 ....	67.7		7.66			.76	4.8
8/17— 8/23/19 ....	65.1		7.69			.79	4.7
Total for period....	258.2	\$1,977.25	\$7.66	56	\$204.00	\$0.78	4.6
8/10— 8/16/19 ....	76.8		\$7.72			\$0.66	5.5
8/ 3— 8/ 9/19 ....	62.3		7.79			.82	4.4
7/27— 8/ 2/19 ....	61.2		7.69			.86	4.1
7/20— 7/26/19 ....	78.1		7.48			.80	4.6
Total for period....	278.4	\$2,133.10	\$7.66	60	\$218.00	\$0.79	4.6
7/13— 7/19/19 ....	80.1		\$7.47			\$0.79	4.5
7/ 6— 7/12/19 ....	77.6		7.61			.81	4.4
6/29— 7/ 5/19 ....	73.5		7.72			.86	4.3
6/22— 6/28/19 ....	74.7		7.65			.82	4.4
Total for period....	305.9	\$2,338.75	\$7.64	69	\$250.00	\$0.82	4.4
6/16— 6/21/19 ....	72.0		\$7.68			\$0.82	4.4
6/ 9— 6/14/19 ....	62.8		7.59			.78	4.5
6/ 2— 6/ 7/19 ....	56.0		7.40			.87	4.2
5/26— 5/31/19 ....	50.3		7.45			.97	3.6
Total for period....	241.1	\$1,822.86	\$7.56	58	\$206.00	\$0.85	4.1
5/19— 5/24/19 ....	42.6		\$7.40			\$1.15	3.2
5/12— 5/17/19 ....	47.5		7.60			1.03	3.4
5/ 5— 5/10/19 ....	55.2		7.50			.90	3.9
4/28— 5/ 3/19 ....	45.9		7.57			1.07	3.3
Total for period....	191.2	\$1,438.43	\$7.52	56	\$196.00	\$1.03	3.4
Grand total.....	1,518.3	\$11,583.69	\$7.63	354	\$1,269.00	\$0.84	4.3

lower price received per ton. Drivers of commercial routes usually believe they should receive more money because they handle more ice. A complete record of the transactions of each wagon is very effective in disproving such claims.

In Table No. 4 is shown a complete record of wagon sales for every wagon in service during the year, whether the wagon

was in service one week or the entire year. It shows the tonnage of coupon and cash sales, and the total tonnage sold. The figures show that the coupon sales were 70.4 per cent of the total. This is a very good showing when it is considered that two years previously the sales were mostly all cash.

Another feature of importance disclosed by the record is the

TABLE III.—ROUTE RECORD

ROUTE RECORD							
Route No. 10		From April 28 to October 11, 1919					
Period	Total Tons	Sales Value	Price Per Ton	No. of Men	Total Wages	Wage Per Ton	Tons Per Man
10/ 5—10/11/19 ....	27.2		\$8.64			\$1.55	2.3
9/28—10/ 4/19 ....	32.6		8.72			1.29	2.7
9/21— 9/27/19 ....	26.5		8.78			1.93	1.9
9/14— 9/20/19 ....	41.1		8.61			1.24	2.9
Total for period....	127.4	\$1,105.55	\$8.69	52	\$186.00	\$1.46	2.5
9/ 7— 9/13/19 ....	38.7		\$8.75			\$1.32	2.8
8/31— 9/ 6/19 ....	30.4		8.83			1.68	2.2
8/24— 8/30/19 ....	37.3		8.74			1.37	2.7
8/17— 8/23/19 ....	40.7		8.63			1.26	2.9
Total for period....	147.1	\$1,283.90	\$8.73	56	\$204.00	\$1.38	2.6
8/10— 8/16/19 ....	44.8		\$8.77			\$1.14	3.2
8/ 3— 8/ 9/19 ....	46.9		8.78			1.09	3.3
7/27— 8/ 2/19 ....	39.2		8.89			1.25	2.8
7/20— 7/26/19 ....	36.6		9.11			1.34	2.5
Total for period....	167.5	\$1,485.80	\$8.87	56	\$200.00	\$1.20	2.9
7/13— 7/19/19 ....	34.8		\$9.02			\$1.41	2.5
7/ 6— 7/12/19 ....	34.7		9.11			1.41	2.5
6/29— 7/ 5/19 ....	29.3		9.09			1.67	2.1
6/22— 6/28/19 ....	30.5		9.26			1.61	2.2
Total for period....	129.3	\$1,179.95	\$9.12	56	\$196.00	\$1.52	2.3
6/16— 6/21/19 ....	29.1		\$9.31			\$1.46	2.4
6/ 9— 6/14/19 ....	28.5		9.33			1.47	2.4
6/ 2— 7/ 7/19 ....	24.8		9.20			1.77	2.0
5/26— 5/31/19 ....	25.7		9.05			1.63	2.1
Total for period....	108.1	\$996.50	\$9.22	48	\$168.00	\$1.55	2.3
5/19— 5/24/19 ....	18.2		\$9.09			\$1.80	2.0
5/12— 5/17/19 ....	19.6		8.87			2.45	1.6
5/ 5— 5/10/19 ....	29.6		9.21			1.42	2.5
4/28— 5/ 3/19 ....	25.2		9.12			1.66	2.1
Total for period....	92.6	\$841.85	\$9.09	45	\$166.00	\$1.79	2.0
Grand total .....	772.0	\$6,893.55	\$8.92	313	\$1,120.00	\$1.45	2.4

similarity in tonnage handled per man on routes serving similar classes of trade, total amount sold and wage cost per ton. This is very clearly shown in routes 4 and 5 and 9 and 10. As illustrative of the difference in wage cost per ton on wagons serving similar class of trade the records of wagons Nos. 1, 2, 25, 27



## ICE DELIVERY

shows that the wage cost ranges from \$1.396 to \$0.995, a difference of \$0.40 per ton. That is quite an item on 922 tons. Attention is called to the slight variations in income per ton received on those four routes.

The table also shows the average tonnage handled per man for every man employed on wagons for the year, the average

TABLE IV.—ROUTE WAGON SALES, FISCAL YEAR 1920

ROUTE WAGON SALES, FISCAL YEAR 1920							
Route No.	Coupon Tonnage	Cash Tonnage	Total Tonnage	Tons per Man	Wages per Ton	Total Sales Value	Income per Ton
1 .....	2,435.2	62.8	2,647.5	3.6	\$ .995	\$ 22,850.31	\$ 8.630
2 .....	2,060.7	69.7	2,232.8	3.0	1.188	19,207.88	8.602
3 .....	1,265.6	185.8	1,593.6	2.9	1.277	14,935.35	9.372
4 .....	745.4	313.7	1,076.9	2.4	1.454	10,821.68	10.048
5 .....	765.0	326.7	1,128.2	2.4	1.448	11,194.56	9.922
6 .....	727.8	245.2	1,000.3	1.9	1.836	9,995.25	9.992
7 .....	330.0	298.5	645.2	2.0	1.704	6,932.17	10.744
8 .....	519.1	370.2	908.3	1.9	1.846	9,662.37	10.637
9 .....	830.7	326.6	1,182.3	2.3	1.582	12,098.71	10.233
10 .....	785.2	344.1	1,166.3	2.3	1.578	12,173.35	10.437
11 .....	451.3	206.7	670.7	2.0	1.705	7,136.30	10.640
12 .....	327.0	337.5	715.8	2.0	1.714	7,790.01	10.882
13 .....	212.2	274.9	494.5	1.9	1.824	5,525.64	11.174
14 .....	448.5	285.7	742.6	2.0	1.803	8,049.66	10.839
15 .....	505.3	278.2	804.4	1.8	1.909	8,643.32	10.745
16 .....	601.8	228.4	858.6	2.2	1.632	8,735.31	10.173
17 .....	459.5	239.5	704.9	1.8	1.869	7,740.91	10.981
18 .....	343.6	285.5	636.5	2.0	1.699	7,090.36	11.139
19 .....	200.5	187.7	401.1	2.0	1.707	4,305.49	10.734
20 .....	203.1	179.2	384.6	2.3	1.476	4,255.24	11.064
21 .....	493.3	250.8	746.9	2.0	1.727	8,072.38	10.807
22 .....	224.9	219.5	459.0	1.9	1.757	5,040.69	10.981
23 .....	204.6	234.0	450.0	2.1	1.693	4,944.01	10.986
24 .....	207.4	169.0	381.7	1.9	1.747	4,158.64	10.895
25 .....	799.9	32.7	922.2	2.6	1.396	7,906.19	8.573
26 .....	204.4	192.0	402.0	1.8	1.890	4,482.13	11.149
27 .....	771.9	29.8	890.6	3.5	1.048	7,694.78	8.639
30 .....	24.2	77.4	105.0	1.1	2.571	1,197.92	11.496
Total....	17,148.1	6,252.5	24,352.5	2.3	\$1.521	\$242,630.51	\$ 9.964

wage cost per ton, and the income per ton on all ice sold. In going over the figures in tons per man and wage per ton, differences will be noticed in wage cost where similar tonnage is handled; this is due to the method of paying the drivers and employment of helpers.

The table shown as Table No. 5 is a report of the total sales for the year, showing net sales, gross sales, meltage and per-

centage of sales each month to total sales. The percentage column contains very interesting information as to the actual fluctuation that occurs in the ice business. It shows that sixty-seven

TABLE V.—TOTAL SALES FOR YEAR

	Net Sales (Tons)	Meltage (Tons)	Gross Sales (Tons)	Per Cent of Total Sales
January .....	925.23	22.98	948.21	1.7
February .....	1,034.48	22.46	1,056.94	1.9
March .....	1,486.09	44.20	1,530.29	2.7
April .....	2,417.48	43.96	2,461.44	4.5
May .....	5,449.95	54.94	5,504.89	9.8
June .....	7,532.39	96.48	7,628.87	13.7
July .....	11,995.61	123.63	12,119.24	21.7
August .....	8,943.45	123.43	9,066.88	16.3
September .....	8,399.20	122.76	8,521.96	15.2
October .....	4,218.47	88.03	4,306.50	7.8
November .....	1,590.84	28.80	1,607.43	2.8
December .....	1,024.16	16.59	1,040.75	1.9
Total .....	55,005.14	788.26	55,793.40	100.0
Percentage .....	98.59	1.41	100.00	.....

per cent of the total ice sales were made in four months. It shows the relatively small amount of business during the other eight months. The meltage is the total amount lost between the amount purchased and amount sold, including platform and carload sales.

**Value of Comparison.**—The ice business is peculiar in itself inasmuch as each month stands by itself. Operating costs, or the amount of business done in one month, cannot be used as a gauge for the following month. However, corresponding months of each year bear close relation to each other in many respects.

Comparison of reports with those of the previous year will disclose increases or decreases in operating expenses, and just where the differences are. Comparison of route records will disclose how the present year compares with the previous one. It will show what routes are increasing or decreasing in sales, costs and tonnage per man, etc. Where routes show a decrease it enables the superintendent to seek out the reason therefor.

Comparison of tonnage per man and wage cost per ton on

each route as shown in Table No. 4, emphasizes the importance that tonnage handled per man has in increasing and decreasing delivery cost. Attention has been called to the range in cost on several routes. Certain conditions are responsible for that wide difference, and with that certain knowledge at hand measures can be taken to reduce that difference. With accurate knowledge as to just what each man is doing, it is possible to maintain a greater uniformity of tonnage handled per man on routes similar in character, and thereby greatly increase the general average.

By having that information the average tonnage per man in one company was increased in 1920 over 1919 by 540 pounds daily, which decreased the wage cost from \$1.66 to \$1.52, a difference of 14 cents, and effected a saving in that feature alone of \$3,400 for the year.

Another feature of the value of such reports was shown when demand was made for better service in two sections of the city, a residential section and in the central district. An additional wagon was put on in each district, and in the central district the wage cost per ton on all ice delivered in that district was reduced three cents per ton, while in the residential district the cost was increased seven cents per ton. In one section the service was improved and more business obtained, and at a less cost per ton. In the other, the service was improved at an increased cost. Knowing exactly what that better service cost, it was simply a question as to whether the improved service was not worth the small increase in cost.

One other feature of having complete records from which reports can be made up, and illustrative of the loss or gain dependent on the tonnage handled per man, is shown in the following table. These figures are for the month of January, 1920, and were taken from the monthly cost analysis and the route records:

The total delivery cost per ton, which includes wages of foremen, truck drivers, truck expense, auto expense, repairs, etc., *but not wagonmen's wages*, for the month averaged \$3.896; barn cost, \$3.151; overhead, \$4.513; cost of ice, \$3.734; a total of \$15.294 per ton. The wage cost per ton on each route is then added to this, which gives the total cost on each route. The income from sales, divided by the tons sold, gives the average income received

per ton; the total cost, deducted from this amount, shows the actual net loss on each route. Figures for five routes are shown, in which the loss per ton and the total amount lost on each route is given. Route No. 1 is located in the central district; No. 3 has some residence trade in it; Nos. 5, 10 and 15 are residential routes. It will be seen that the loss varies from \$7.211 per ton to \$9.018, a difference of \$1.807.

TABLE VI.—SHOWING LOSS ON WINTER DELIVERY

<i>Route No. 1. Central District. Total Sales, 141.4 Tons.</i>	
(Income Per Ton, \$8.228)	
Total Cost Per Ton .....	\$15.294
Wage Cost Per Ton .....	1.534
Total .....	\$16.828
Total Cost .....	\$2,379.47
Total Income .....	1,163.49
Total Loss .....	\$1,215.98
Cost Per Ton .....	\$16.828
Income Per Ton .....	\$ 8.228
Loss Per Ton .....	\$ 8.600
Tons handled per man, 2.4 tons.	

<i>Route No. 3. Central and Res. Total Sales, 74.7 Tons.</i>	
(Income Per Ton, \$8.691.)	
Total Cost Per Ton .....	\$15.294
Wage Cost Per Ton .....	1.660
Total .....	\$16.954
Total Cost .....	\$1,266.46
Total Income .....	649.72
Total Loss .....	\$ 616.74
Cost Per Ton .....	\$16.954
Income Per Ton .....	8.691
Loss Per Ton .....	\$ 8.263
Tons handled per man, 2.3 tons.	

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TABLE VI—(Continued)

<i>Route No. 5. Residential District. Total Sales, 60.3 Tons.</i>	
(Income Per Ton, \$8.898)	
Total Cost Per Ton .....	\$15.294
Wage Cost Per Ton .....	1.840
Total .....	\$17.134
Total Cost .....	\$1,033.18
Total Income .....	536.59
Total Loss .....	\$ 496.59
Cost Per Ton .....	\$17.134
Income Per Ton .....	8.898
Loss Per Ton .....	\$ 8.236
Tons handled per man, 2.1 tons.	
<i>Route No. 10. Residential District. Total Sales, 57.8 Tons.</i>	
(Income Per Ton, \$9.934)	
Total Cost Per Ton .....	\$15.294
Wage Cost Per Ton .....	1.851
Total .....	\$17.145
Total Cost .....	\$ 990.98
Total Income .....	574.19
Total Loss .....	\$ 416.79
Cost Per Ton .....	\$17.145
Income Per Ton .....	9.934
Loss Per Ton .....	\$ 7.211
Tons handled per man, 2.1 tons.	
<i>Route No. 15. Residential District. Total Sales, 30.7 Tons.</i>	
(Income Per Ton, \$9.790)	
Total Cost Per Ton .....	\$15.294
Wage Cost Per Ton .....	3.514
Total .....	\$18.808
Total Cost .....	\$ 577.40
Total Income .....	300.54
Total Loss .....	\$ 276.86

Cost Per Ton .....	\$18.808
Income Per Ton .....	9.790
<hr/>	
Loss Per Ton .....	\$ 9.018
Tons handled per man, 1.1 tons.	

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There are many other features that could be pointed out in connection with reports, but sufficient has been described to show the real value of them. Many companies have reports of various kinds, some very complete, and some very complex; but in many cases they are never made use of; the figures are glanced at, and probably the totals noted, and they are filed away. Any manager, or head of a department, that does not look upon his reports as the most important part of his accounting system is missing the one feature that will give him control of the operations.

**Figure Pictures.**—Figures are the barometer of business, which if rightly interpreted tell the exact story of successful or unsuccessful enterprise. Reports and statements are made to enable an executive to intelligently analyze whether or not maximum efficiency has been procured with the different expenditures. When reports or statements are presented in the form of written manuscripts made up of words and figures it not only takes up a great deal of an executive's time to study them in order to arrive at the real conditions, but they are more or less confusing, especially to those not accustomed to figuring. Graphic and circular charts, "figure pictures," are becoming generally used in many businesses to portray in an easily understandable way business results.

In the delivery department of an ice company a majority of the superintendents and foremen are selected principally for their practical knowledge of the business. Their ability to figure or analyze reports is given little consideration. Charts, such as shown in this book, will graphically portray to these men figure facts that they would scarcely conceive if presented in words and figures. Charts are easily prepared and easily read and their more general use in the ice business would undoubtedly be of great value. Several are shown in various chapters which illustrate their character.

## CHAPTER VIII.

### COST OF DELIVERY.

**Ice Delivery Cost High.**—A pamphlet issued several years ago by the Bureau of Census, giving detailed figures on cartage costs in the city of Washington, D. C., showed the cost of delivery for ice was higher than for any other commodity delivered.

**Ice Delivery.**—The figures were based mainly upon reports from 128 firms or companies, but these represented about one-third of the total business transacted. The average delivery cost for all establishments was found to be 6.2 per cent of the total gross sales. But some were many times as high as the average. Thus on ice where total gross sales for the one concern canvassed were \$359,580, the cost of delivery alone was \$163,800, or 45.6 per cent of the gross sales. On ice cream, total gross sales by four concerns were \$908,993; total delivery cost \$135,322, or 14.9 per cent. But one of these companies, selling \$126,041 worth of ice cream, found the delivery cost to be \$50,416, or 40.6 per cent. In no other line of business was the percentage of delivery cost anywhere near as high as for ice and ice cream.

Costs are a very important factor in ice delivery. In these days of constantly rising costs the company that is not equipped with an accounting system which will furnish accurate cost figures daily, weekly and monthly, will naturally fail in time.

As an illustration of accurate data on costs and showing the variance of cost under varying conditions in the delivery of ice, the following tables present figures showing the cost in several districts of a city of 300,000 population. This data was compiled

several years ago, when everything was much lower than at present, but it serves to bring out the points necessary. At the time these figures were compiled the company delivered ice on the monthly system, 25 and 50 pounds daily at so much per month. The ice served was all natural ice.

TABLE VII.—DISTRICT COST STATEMENT

Accounts	District No. 1		District No. 4	
	Routes 1-5-6-31-32-33		Routes 8-14-25-30-41-42	
	Cost	Per Ton	Cost	Per Ton
<b>Delivery:</b>				
Foremen .....	\$ 987.41	.07	\$ 729.02	.15
Scalemen .....	286.84	.02	204.48	.04
Wagonmen .....	9,288.61	.70	6,347.67	1.32
Shoeing .....	414.25	.03	301.73	.07
Total .....	10,977.11	.82	7,582.90	1.58
<b>Barn.</b>				
Labor .....	1,014.99	.08	771.30	.16
Veterinary .....	169.58	.01	123.33	.03
Feed .....	2,389.50	.18	1,852.62	.38
Total .....	3,574.07	.27	2,747.25	.57
<b>Repairs:</b>				
Wagon .....	283.70	.02	180.22	.04
Harness .....	117.15	.01	93.26	.02
Sundries .....	508.81	.04	394.04	.08
Total .....	909.66	.07	667.52	.14
Total delivery expense....	\$15,460.84	1.16	\$10,997.67	2.29
<b>Ice:</b>				
Value .....	6,482.88	.49	3,101.18	.64
Freight .....	4,193.55	.32	1,799.02	.38
Total .....	10,676.43	.81	4,900.20	1.02
Sundry delivery expense....	2,545.09	.19	1,739.23	.36
<b>General expense.</b>				
Salaries .....	3,994.10	.30	2,729.50	.57
Sundries .....	2,136.38	.16	1,459.96	.30
Total .....	6,130.48	.46	4,189.46	.87
Total cost .....	\$34,812.84	2.62	\$21,826.56	4.54
Ice charged .....	13,187.8		5,340.8	
Ice reported .....	13,285.5		4,803.5	
Over .....	97.7			
Short .....			537.3	
<b>Daily averages:</b>				
Customers per wagon .....	43		203	
Ice delivered, tons per wagon.	7.83		3.70	

The drivers were paid \$80 a month, helpers \$65, and foremen \$90 to \$100. Forty peddling wagons were operated. Six foremen and two checkers were employed.

In compiling these costs for different sections of the city, routes were grouped according to class of trade served; congested and scattering, routes serving strictly family trade, mixed trade, and the central routes serving saloons, restaurants, etc., shown in table as District No. 1. The average number of customers served,



## ICE DELIVERY

and tons delivered per wagon in the respective districts are the daily averages obtained by each during the entire time the wagon was in operation.

TABLE VIII.—DISTRICT COST STATEMENT

Accounts	District No. 2		District No. 5	
	Routes 2-3-19-21		Routes 9-12-29-36	
	Cost	Per Ton	Cost	Per Ton
<b>Delivery.</b>				
Foremen .....	\$ 505.64	.20	\$ 493.04	.15
Scalemen .....	132.79	.05	132.39	.04
Wagonmen .....	3,668.23	1.50	4,050.32	1.25
Shoeing .....	166.04	.07	174.54	.06
Total .....	4,472.70	1.82	4,850.29	1.50
<b>Barn.</b>				
Labor .....	486.09	.20	481.72	.15
Veterinary .....	83.13	.03	78.59	.02
Feed .....	1,043.90	.43	1,103.00	.34
Total .....	1,613.12	.66	1,663.31	.51
<b>Repairs:</b>				
Wagon .....	105.20	.05	103.55	.03
Harness .....	58.55	.02	58.68	.02
Sundries .....	218.40	.09	228.05	.07
Total .....	382.15	.16	390.28	.12
Total delivery expense	\$ 6,467.97	2.64	\$ 6,903.88	2.13
<b>Ice:</b>				
Value .....	1,581.87	.64	2,183.87	.68
Freight .....	925.38	.38	1,140.04	.35
Total .....	2,507.25	1.02	3,323.91	1.03
Sundry delivery expense. . .	1,005.11	.41	1,109.79	.34
<b>General expense:</b>				
Salaries .....	1,577.35	.64	1,741.63	.54
Sundries .....	843.70	.35	931.57	.29
Total .....	2,421.05	.99	2,673.20	.83
Total cost .....	\$12,401.38	5.06	\$14,010.78	4.33
<b>Ice charged.</b> .....	2,785.4		3,657.9	
<b>Ice reported.</b> .....	2,452.3		3,233.6	
<b>Over</b> .....				
<b>Short</b> .....	333.1		424.3	
<b>Daily averages:</b>				
Customers per wagon .....	178		173	
Ice delivered, tons per wagon.	3.07		4.00	

District No. 4 covered a territory in which most of the buildings are flats and apartments, with the usual class of stores found in such localities.

District No. 2 is a residential district, where the houses are scattered. District No. 5 is a congested district containing stores, restaurants, etc.

District No. 7 is a strictly residential section, houses occupying 50-foot lots and not a saloon in the entire district.

The figures in the second column of Table 9 are the total cost of all routes, with the average number of customers served

daily by all wagons, and the average tons delivered daily by each wagon for the period each was in operation.

The figures in column one of Table No. 10 designated as

TABLE IX.—DISTRICT COST STATEMENT

Accounts.	District No. 7		Total	
	Routes 7-10-20-23-39		All Routes	
	Cost	Per Ton	Cost	Per Ton
<b>Delivery:</b>				
Foremen .....	\$ 590.11	.14	\$ 5,199.24	.13
Scalesmen .....	146.95	.03	1,371.83	.03
Wagonmen .....	5,368.52	1.29	44,157.03	1.14
Shoeing .....	210.99	.05	1,991.16	.05
Total .....	6,316.57	1.51	52,719.26	1.35
<b>Barn:</b>				
Labor .....	594.61	.14	5,258.64	.14
Veterinary .....	95.54	.02	847.36	.02
Feed .....	1,403.13	.34	12,382.87	.32
Total .....	2,093.28	.50	18,488.87	.48
<b>Repairs:</b>				
Wagon .....	119.01	.03	1,235.36	.03
Harness .....	71.17	.02	630.55	.02
Sundries .....	286.94	.07	2,622.79	.07
Total .....	477.12	.12	4,488.70	.12
Total delivery expense...	\$ 8,886.97	2.13	\$75,696.83	1.95
<b>Ice:</b>				
Value .....	3,406.70	.82	25,470.82	.66
Freight .....	1,411.16	.34	11,727.15	.30
Total .....	4,817.86	1.16	37,197.97	.96
Sundry delivery expense.....	1,470.98	.35	12,099.02	.31
<b>General expense:</b>				
Salaries .....	2,308.46	.55	18,987.52	.49
Sundries .....	1,234.77	.30	10,156.12	.26
Total .....	3,543.23	.85	29,143.64	.75
Total cost .....	\$18,719.04	4.49	\$154,137.46	3.97
Ice charged .....	4,656.1		41,795.8	
Ice reported .....	4,171.6		38,866.4	
Over .....				
Short .....	484.5		2,929.4	
<b>Daily averages:</b>				
Customers per wagon.....	221		165	
Ice delivered, tons per wagon.	4.19		4.51	

wholesale is for ice delivered in load lots to large users and car icing.

The figures shown in the second column are the total cost and cost per ton for all ice delivered by wagons only.

In territory where competition for trade is very keen, an accurate knowledge of costs is very essential. This fact is amply demonstrated by the figures in Table No. 11. It is logical to believe that if all the competing companies operating in District "N," instead of only one, knew that the loss on each ton of ice delivered in that district amounted to \$1.96, as shown by

## ICE DELIVERY

the figures in the table, the fight would have been discontinued much sooner than it was. Such figures are a potent factor in making competitors see the advisability of changing their methods.

The figures in Table No. 11, for District "N," are the costs in a district where there was a fight for the trade. In District "H" there was very little competition.

TABLE X.—DISTRICT COST STATEMENT

Accounts.	Wholesale		Total Routes and Wholesale	
	Cost	Per Ton	Cost	Per Ton
Delivery:				
Foremen .....	\$ 251.17	.02	\$ 5,450.41	.11
Scalemen .....	326.02	.03	1,697.85	.03
Wagonmen .....	6,079.69	.46	50,236.72	.97
Shoeing .....	179.75	.01	2,170.91	.04
Total .....	6,836.63	.52	59,555.89	1.15
Barn:				
Labor .....	515.48	.04	5,774.12	.11
Veterinary .....	86.26	....	933.62	.02
Feed .....	1,144.67	.09	13,527.54	.26
Total .....	1,746.41	.13	20,235.28	.39
Repairs:				
Wagon .....	71.98	..	1,307.34	.03
Harness .....	56.77	.01	687.32	.01
Sundries .....	225.40	.02	2,848.12	.05
Total .....	354.15	.03	4,842.85	.09
Total delivery expense. .	\$ 8,937.19	.68	\$84,634.02	1.63
Ice:				
Value .....	7,821.98	.59	33,292.80	.64
Freight .....	5,079.37	.39	16,806.52	.32
Total .....	12,901.35	.98	50,099.32	.96
Sundry delivery expense.....	1,661.93	.13	13,760.95	.27
General expense:				
Salaries .....	2,642.14	.20	21,629.66	.42
Sundries .....	1,434.58	.11	11,590.70	.22
Total .....	4,076.72	.31	33,220.36	.64
Total cost .....	\$27,577.19	2.10	\$181,714.65	3.50
Ice charged .....	13,106.0		54,901.8	
Ice reported .....	13,106.0		51,972.4	
Over .....	..		2,929.4	
Short .....	....			

Table No. 12 is a summary showing a comparison of cost between two years. General expense shows a reduction all through. At station "E" it is noticeable that while the cost of ice has been reduced \$0.3970, the total cost has only been reduced \$0.1047.

Compilation of data on delivery expense to family and to commercial trade in one city showed that the highest to domestic ice boxes were twenty-seven per cent of total delivery for the best month, and in December only seven per cent of the total

delivery went to the family trade. Even with twenty-seven per cent delivered to the family trade and seventy-three per cent to commercial business, three times the labor and three times the teams were required to deliver the twenty-seven per cent. This

TABLE XI.—SHOWING LOSS AND GAIN IN TWO DISTRICTS

	District N 4,421 Tons		District H, 12,575 Tons	
	Total Amount	Cost Per Ton	Total Amount	Cost Per Ton
Total cost of Ice	\$ 4,933.84	\$1 1160	\$14,033.70	\$1 1160
Delivery Expense				
Labor				
Superintendents ..	2,587.65	5853	1,188.72	.0945
Foremen .....			1,214.09	.0965
Wagonmen .....	8,233.55	1,8622	14,606.38	1.1616
Car Checkers .....			499.18	.0397
Station Clerks .....	713.13	1613	735.00	.0584
Yardmen .....	30.60	0069	181.78	.0145
Total ..	\$11,564.93	\$2 6158	\$18,425.15	\$1.4652
Stable Expense .....	8,040.03	1.8185	10,471.90	.8328
Tool Repairs .....	143.64	.0325	187.11	.0149
Miscellaneous .....	1,541.60	.3487	2,744.80	.2183
Total Delivery Expense	\$21,290.20	\$4.8155	\$31,828.96	\$2.5312
Total General Expense ..	5,790.79	1.3098	10,286.20	.8180
Total Cost. ....	\$32,014.83	\$7.2413	\$56,148.86	\$4.4652
Ice Sales Income .....	23,342.27	5.2800	73,113.02	5.8141
Net Profit—Loss.	\$ 8,672.56	— \$1.9613	\$16,964.16	+ \$1.3489

showed that the domestic business was not as desirable, yet it had been thought heretofore, the most profitable end of the business.

In connection with the above statement the following figures for March, 1917 (Table 13) taken from a report showing the costs and income in each of six districts of a city of over 300,000 population show that the loss per ton during the winter months is greater in a family district than in a commercial district.

District "C" is in the central section of the city, where the trade is mostly saloons, cafes, restaurants, etc. District "B" is strictly a residential district, not a saloon in the entire district.

The preceding table shows the different items which make up the total cost for one month in two districts in which the class of trade served is entirely dissimilar. As previously stated, the month shows the loss per ton is greater in the residential district

than in the central district. It will also be noted that the loss per ton in 1917 is much less than in 1916.

We will now go farther and show the results in these two districts for the year 1917. Chart No. 3, Fig. 29, shows that in District "C" the margin between total cost and income per ton ranges from a loss of \$2.213 per ton to a profit of \$.994 a ton. In Chart No. 4, Fig. 30, the difference between total cost and income per ton ranges from a loss of \$6.473 per ton to a profit of \$2.400 a ton.

TABLE XII.—COMPARISON OF COSTS OF TWO YEARS

		Cost of Ice		Delivery Expense		General Expense		Total Cost	
		1914	1913	1914	1913	1914	1913	1914	1913
District	C	\$1.1160	\$1.0850	\$1.3586	\$1.2730	\$0.4440	\$0.4700	\$2.9186	\$2.8280
"	M	1.1160	1.2290	1.9454	2.0780	0.6516	0.7690	3.7130	4.0760
"	N	1.1160	1.3910	4.8155	3.4780	1.3098	1.1181	7.2413	5.9871
"	E	1.1160	1.5130	3.3338	2.9720	0.9965	1.0660	5.4463	5.5510
"	H	1.1160	1.2000	2.5312	2.5890	0.8180	0.9310	4.4652	4.7210
"	B	1.1160	1.2070	3.0195	2.9430	0.9320	1.0260	5.0675	5.1750
District C	Wholesale }	1.1160	1.0850	0.5780	0.7230	0.1951	0.2840	1.8891	2.0920
District M	Wholesale }	1.1160	1.0100	0.7810	0.8550	0.3036	0.3810	2.2007	2.2460
Platform		1.1160	1.2540	.. .	.. .	0.2500	0.2500	1.3660	1.5040
Carloads		0.7830	0.6670	.	.	0.2500	0.2500	1.0330	0.9170

General Expense is charged off proportionately to the wagon men's wages.

These are actual figures obtained from a company that has a fairly efficient organization, a cost system that furnishes facts and in which costs are rigidly watched.

The public generally believes the ice man gets an exorbitant price for his ice. The householder who pays 45 cents a hundred pounds thinks that the ice dealer gets \$9.00 a ton for all the ice he sells. Chart No. 4, Fig. 30, shows that in a purely residential district, in which most of the coupon books sold were at the rate of \$2.25 for a 500-pound book (\$9.00 a ton), the highest average price received was \$7.21, while it ran as low as \$4.95; in

# COST OF DELIVERY

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TABLE XIII.—DISTRICT COST STATEMENT

	DISTRICT "C"			
	1917—(1904 Tons)		1916—(1760 Tons)	
	Cost	Per Ton	Cost	Per Ton
Cost of Ice—Total.....	\$2,034.30	1.068	\$2,001.00	1.137
Delivery Expenses—Labor—				
Superintendents.....	129.82	.068	144.25	.082
Foremen.....	155.52	.082	90.05	.051
Wagonmen.....	1,477.21	.776	1,490.13	.847
Car Checkers.....	72.68	.038	78.00	.044
Station Clerks.....	117.50	.062	170.00	.097
Yard Men.....	52.58	.027	17.88	.010
Total.....	\$2,005.31	1.053	\$1,990.31	1.131
Stable Expense.....	1,192.30	.626	1,104.00	.627
Miscellaneous.....	647.40	.340	991.85	.563
Total Delivery Expense	\$3,845.01	2.019	\$4,086.16	2.321
General Expense—Total.....	\$2,363.70	1.242	\$2,758.20	1.567
Total Cost.....	\$8,243.01	4.329	\$8,845.36	5.025
Ice Sales Income.....	5,504.29	2.891	5,276.01	2.997
Loss.....	\$2,738.72	1.438	\$3,569.35	2.028

	DISTRICT "B"			
	1917—(683 Tons)		1916—(582 Tons)	
	Cost	Per Ton	Cost	Per Ton
Cost of Ice—Total.....	\$ 729.95	1.068	\$ 661.40	1.137
Delivery Expense—Labor—				
Superintendents.....	150.00	.220	141.00	.242
Foremen.....	133.02	.195	109.80	.189
Wagonmen.....	1,006.57	1.474	1,077.96	1.852
Car Checkers.....				
Station Clerks.....	85.00	.124	75.00	.129
Yard Men.....	72.46	.106	63.96	.110
Total.....	\$1,447.05	2.119	\$1,467.72	2.522
Stable Expense.....	1,192.30	1.746	1,369.42	2.353
Miscellaneous.....	440.69	.645	717.40	1.233
Total Delivery Expense	\$3,080.04	4.510	\$3,554.54	6.108
General Expense—Total.....	\$1,604.02	2.349	\$1,996.29	3.430
Total Cost.....	\$5,414.01	7.927	\$6,212.23	10.673
Ice Sales Income.....	3,469.01	5.080	2,848.27	4.894
Loss.....	\$1,945.00	2.847	\$3,363.96	5.779

## ICE DELIVERY

the central district the highest was \$3.66 per ton and the lowest \$2.89 per ton.

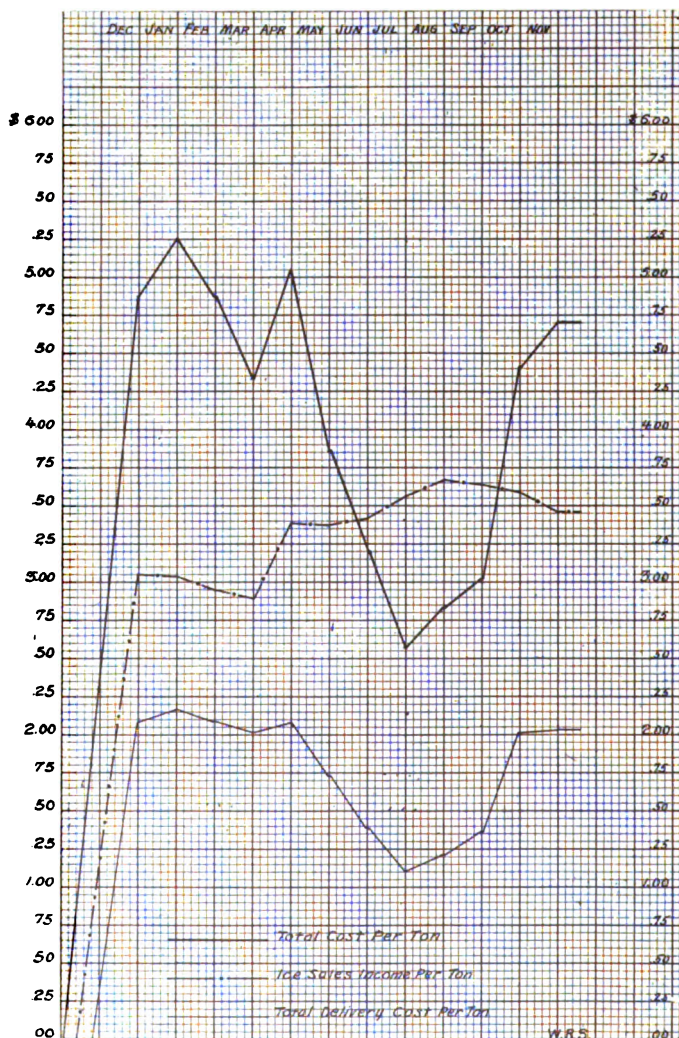


FIG 29.—TOTAL COST PER TON, INCOME PER TON, TOTAL DELIVERY COST PER TON—CENTRAL DISTRICT

Attention is called to the big margin existing between the total cost line and the total delivery cost line. The total delivery cost includes every item of expense directly chargeable to de-



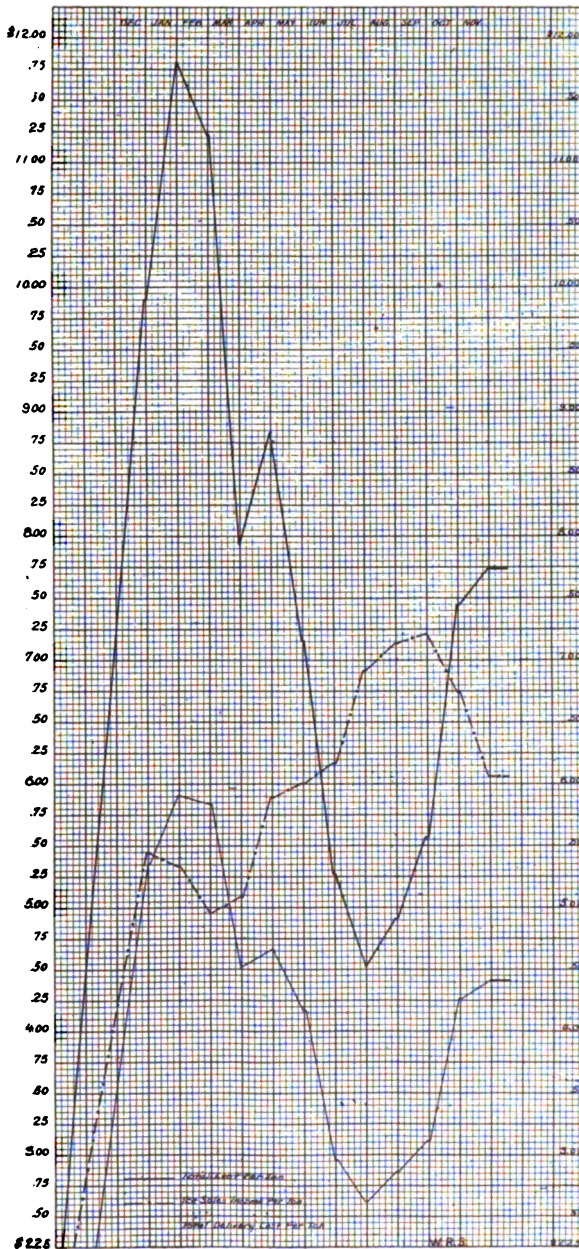


FIG. 30.—TOTAL COST PER TON, INCOME PER TON, TOTAL DELIVERY COST PER TON—RESIDENTIAL DISTRICT



livery. The total cost includes cost of ice, general expense, or overhead, and total delivery expense, as shown in Table No. 9.

It will be seen that the difference in money between these two lines represents a large sum on the yearly tonnage sold and the man who figures his costs on the delivery line, plus cost of ice, disregarding the items which make the total cost line, cannot exist very long. \

Many companies have cost sheets showing the various items of cost. We may compare these with others containing the same items, and the items of cost may be exactly alike, yet there is quite a difference in the delivery cost per ton. Where is it? The wages paid are identical, horse feed, supplies, etc., exactly alike, depreciation allowance the same. What is the reason for the difference?

It is in the tonnage delivered per man and per wagon.

Each tenth of a ton materially reduces this cost. For illustration, we will assume that during April, from the first to the eighth, a company operates seven wagons with ten men; from the tenth to the twenty-second, ten wagons, with fourteen men, and from the twenty-fourth to the twenty-ninth twelve wagons, with twenty men. Here is what we get:

	Operating days	Total men	Av. daily tonnage	Total tonnage
April 1-8 .....	49	70	2.0	140
April 10-22.....	120	168	2.3	386
April 24-29.....	72	120	2.5	300
	<hr/> 241	<hr/> 358	<hr/> 2.3	<hr/> 826

Dividing 241 by 25, the number of operating days in the month, gives an average of 9.6 wagons operating daily; 25 into 358 gives an average of 14.3 men daily for the month; 358 into 826 gives a daily tonnage per man of 2.3 tons, or a total for the 14.3 men of 33 tons daily. Assuming that the average wage per day per man is \$2.80, the wage for 14.3 men is \$40.04 a day. This, divided by the tonnage, 33 tons, gives a wage cost of \$1.2122 per ton.

Now take another company with every item as above with the single exception that the daily average per man is 2.6 tons, an increase of three-tenths of a ton. In this case, we find the

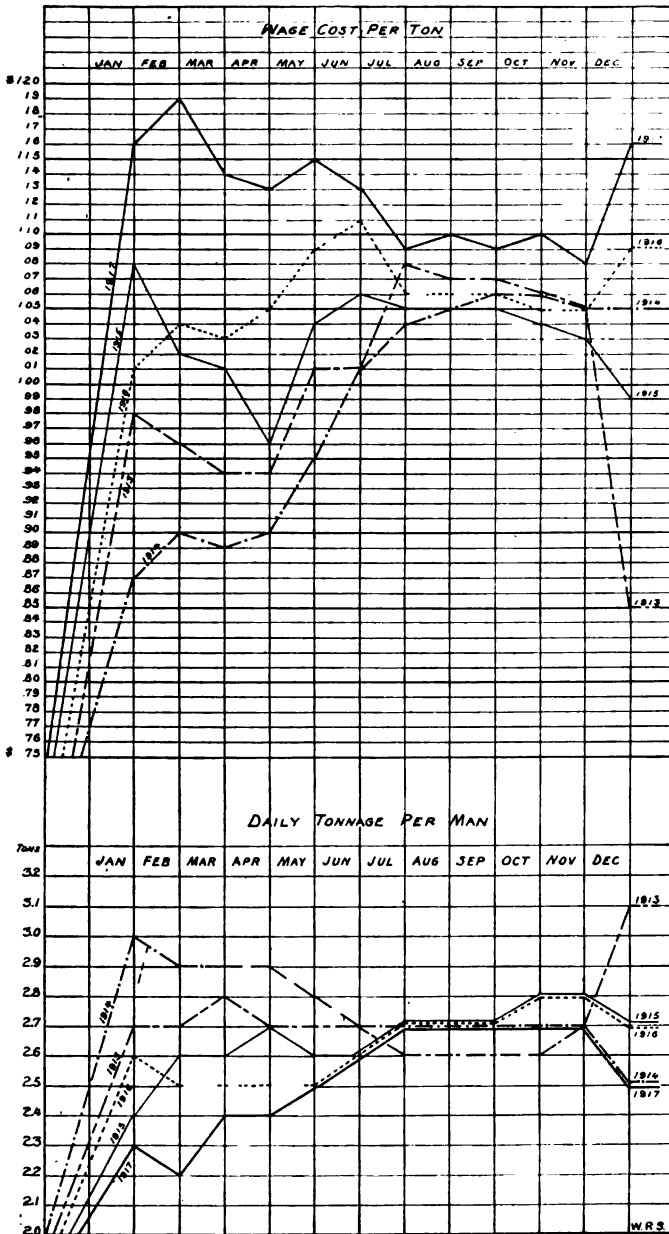


FIG. 31.—WAGE COST PER TON AND DAILY TONNAGE PER MAN

total daily tonnage for the 14.3 men is thirty-seven tons; \$40.04 divided by 37 gives \$1.0821, or a difference of \$0.1301 per ton in labor cost alone. The difference of three-tenths of a ton per man per day for the twenty-five days amounts to 107.4 tons.

Chart No. 5, Fig. 31, graphically illustrates the relation of tonnage to wage cost per ton, as it shows the wage cost per ton and tonnage per man on routes for a period of five years. This company sells ice for coupons, and at the peak of the load operates 120 route wagons, and fifteen wholesale wagons. The tonnage of the wholesale wagons is not included in the figures shown. Attention is called to the disparity in tonnage handled during the winter months of the various years, particularly that the months of January, February and March of '15, '16, '17, show a big decrease in tonnage for similar months of '13 and '14. This is due principally to increase in competition. It is noticeable how the tonnage line from July until December of the various years parallel each other.

The chart shows the necessity of increasing the winter sales of ice or decreasing the number of companies delivering ice from November to May. The fluctuation in tonnage from November to May during the various years is due principally to the increase in the number of dealers that maintain a delivery service during those months.

**Customers and Tonnage Per Wagon.**—The subject of what is a fair average tonnage per wagon per day has received a great deal of discussion. The average tonnage per wagon is of some value, but it is far more important to know the average tonnage per man.

From what has been said on this subject at conventions, it is evident that very few have accurate data either on average tonnage per wagon or man. Some have stated they have wagons that will put out eighteen to twenty tons a day. That is probably so on a Saturday, but one day's output does not mean anything; it is the average per day for a week and for the season that should be considered.

As illustrative of the number of customers served and tonnage delivered, more for comparative purposes than anything else, the figures set forth in the following tables will probably

prove of interest to those who have similar figures. They are the results obtained on routes serving different classes of trade, covering a period of five months—May to October. This company handled natural ice only. Family trade was served under the monthly system 25 and 50 pounds daily. Each one of these

TABLE XIV.—SHOWING TONNAGE DELIVERED

STATION B (42 WAGONS).				STATION E (16 WAGONS).			
Route No.	Total Tonnage 5 Months.	Average Daily Tonnage.	Average No. Customers Daily.	Route No.	Total Tonnage 5 Months.	Average Daily Tonnage.	Average No. Customers Daily.
1	683	5.3	246	88	783	6.1	147
3	684	5.3	217	89	694	5.4	252
11	593	4.6	267	90	624	4.8	231
12	619	4.8	234	91	650	5.0	193
15	725	5.6	259	92	641	5.0	180
17	683	5.3	257	93	417	3.2	165
18	587	4.6	253	94	440	4.3	169
20	573	4.4	234	95	627	4.9	175
22	406	4.4	220	96	529	4.7	209
24	736	5.7	230	97	613	4.7	184
26	513	4.0	221	98	438	4.3	135
27	642	5.0	236	99	575	4.5	167
28	661	5.1	249	100	487	4.7	149
29	465	4.6	207	107	457	6.7	91
37	497	3.8	195	119	251	3.9	216
38	781	6.1	221	120	254	4.7	211
39	675	5.2	256				
40	514	4.7	228				
46	533	4.7	231				
47	473	3.7	197				
48	409	3.2	170				
50	789	7.0	267				
51	613	4.7	240				
52	552	5.3	237				
53	540	4.2	193				
56	521	5.0	221				
57	611	5.1	224				
59	776	6.9	250				
60	608	5.9	262				
63	504	3.9	176				
67	726	5.6	251				
68	649	5.0	263				
69	569	5.0	256				
74	578	5.6	261				
101	357	3.5	163				
102	381	3.7	161				
103	256	2.5	147				
106	335	4.9	257				
114	182	2.6	135				
116	143	4.4	192				
117	285	4.8	237				
118	249	4.2	249				

STATION C (10 WAGONS)			
Route No.	Total Tonnage 5 Months.	Average Daily Tonnage.	Average No. Customers Daily.
5	1549	12.0	63
6	1296	10.0	69
31	1300	10.1	28
32	1543	12.0	30
33	2317	18.0	39
62	1233	9.6	64
84	2026	15.7	41
85	1248	12.2	61
86	1300	11.4	52
87	1682	13.0	37

wagons was not in service the entire five months, but the amount shown opposite each wagon is the average tonnage delivered, and customers served, for each day it was in service, and the total tonnage for each wagon during the period.

## ICE DELIVERY

In the territory covered by Station "B" there was not a saloon in the entire district, a strictly residential section—one and two-family houses on 50-foot lots. Station "E" served quite a few saloons, but the residential trade was widely scattered. Sta-

TABLE XV.—SHOWING TONNAGE DELIVERED

STATION N (28 WAGONS).				STATION H (24 WAGONS).			
Route No.	Total Tonnage 5 Months.	Average Daily Tonnage	Average No. Customers Daily.	Route No.	Total Tonnage 5 Months.	Average Daily Tonnage	Average No. Customers Daily.
2	770	5.9	161	7	653	5.0	243
4	877	6.8	224	10	695	5.4	243
8	919	6.3	260	13	530	4.1	160
9	1273	9.9	78	14	354	3.8	195
19	574	4.4	203	16	570	4.4	209
21	545	4.2	226	23	466	3.6	220
25	844	6.5	224	35	828	6.4	133
30	741	5.7	271	45	717	6.5	177
34	656	5.1	224	58	1067	8.3	185
36	588	4.5	215	61	631	6.1	225
41	769	6.0	181	73	557	5.1	243
42	718	5.6	265	75	277	2.3	78
43	711	5.5	218	76	784	6.9	232
44	562	4.4	226	77	582	5.7	187
49	465	4.8	110	78	954	9.9	129
54	679	5.3	243	79	911	7.1	160
55	282	2.7	130	80	783	6.1	221
64	296	2.9	130	81	433	4.2	180
65	946	7.3	165	82	498	5.1	222
66	965	7.5	151	83	604	5.9	235
70	695	5.4	127	104	485	7.1	113
71	757	5.9	271	105	435	4.6	207
72	511	5.3	243	109	317	4.9	172
108	416	6.3	71	115	513	7.1	159
110	153	4.3	192				
111	169	4.8	213				
112	458	7.7	158				
113	307	9.0	119				

SUMMARY OF STATION RECORD.

Station	Total Tonnage 5 Mos.	Average Tonnage Per Wagon	Average Daily Tonnage.	Average No. Customers Daily
B.....	22,676	540	4.8	225
" N.....	17,546	627	5.7	189
" H.....	14,644	610	5.6	189
" E.....	8,480	530	4.8	180
" C.....	15,494	1549	12.4	48

tion "C" served the central section of the city, hotels, saloons, restaurants, etc. Very little supply work was done, as the loading points were so located that route wagons could go after their own ice.

Stations "N" and "H" served a section of the city in which

the trade was of the same character—saloons, stores, apartments and dwelling houses; the average daily tonnage shows a difference of only one-tenth of a ton; average number of customers exactly the same.

Many of the wagons greatly exceeded the amounts shown, as for example, the wagons below averaged the following amounts during the entire month of July:

TABLE XVI.—TONNAGE AND CUSTOMERS SERVED

Wagon No	Custo- mers	Daily Tonnage	Wagon No.	Custo- mers	Daily Tonnage
60	318	6.6	83	281	7.2
7	317	6.8	58	240	9.9
76	316	8.9	66	182	9.4
89	315	7.2	78	145	11.2
54	307	6.9	85	81	14.2
80	296	8.0	5	58	16.2
71	294	6.6	84	44	19.6
59	284	8.1	33	38	21.9

**Per Ton Cost of Wagon, Horse and Harness.**—In determining costs in factories using machinery, the interest on investment in each machine, depreciation, obsolescence, cost of floor space occupied, power consumed per hour to operate machine, is figured up and the cost per hour determined. This is a fixed cost and is included in the producing cost. The more hours the machine is kept working the lower the producing cost per unit.

We have practically the same thing in the delivery department with the wagon, horse and harness. In figuring costs how many include a fixed charge per ton for wagon and team and realize that the less days such equipment is used the higher per ton the cost is? For illustration:

We will take a company operating six wagons at the peak of the load and determine the cost per ton by ascertaining the operating days of the equipment in each year. We will assume there is:

One wagon in operation 3 months, 6 days to the week.... 77 days  
 Two wagons in operation 2 months, 6 days to the week....104 days  
 Four wagons in operation 1 month, 6 days to the week....104 days  
 Five wagons in operation 1 month 7 days to the week....150 days  
 Six wagons in operation 3 months, 7 days to the week....552 days  
 Three wagons in operation 1 month, 6 days to the week.... 78 days  
 Two wagons in operation 1 month, 6 days to the week.... 52 days

1117 days

While the above figures are not taken from an actual record, approximately they are correct. They show that out of a total of 1,878 days the equipment is working only 1,117 days, or 59.9 per cent. We will now take up the amount invested in wagons, interest on investment and depreciation, which is as follows:

Six wagons at \$200 per wagon.....	\$1,200.00
Interest at six per cent on \$1,200.....	72.00
Depreciation on wagons, eight per cent.....	96.00
	<hr/>
	\$ 168.00

The total, \$168, divided by 1,117 days, gives an average of 15 cents a day. On an average of two and a half tons of ice delivered per day, it would be 6.0 cents per ton.

As horses and harness are not always idle when wagons are, we will consider them separately.

Seven horses at cost of \$260.00 per head.....	\$1,820.00
Six sets single harness at \$35 per set.....	210.00
	<hr/>
	\$2,030.00
Interest at six per cent on \$2,030.00.....	\$ 121.80
Depreciation based on average life of horse as seven years, seven horses at \$37 per head.....	259.00
Depreciation on harness, 15 per cent.....	31.50
	<hr/>
	\$ 412.30

This sum, \$412.30, divided by 1,117 days gives an average of 36.9 cents per day. On an average of two and a half tons of ice delivered per wagon per day, it will be 14.7 cents per ton. A total of 20.7 cents per ton for interest on investment and depreciation of wagons, horses and harness. This is in addition to feed, stable expense, shoeing, repairs, etc.

On the basis figured above we find that the equipment is in use only 60 per cent of the time. If we increase that time 15 per cent, still leaving 25 per cent idle time, we reduce the total cost per day to 45 cents, or, on the same tonnage basis per day, the per ton cost is 18 cents, a saving of 2.7 cents per ton. If we increase the tonnage to three tons per day on the 1,117 operating days, we reduce the per ton cost to 17.3 cents, and by increasing

the operating days and tonnage both, we reduce the per ton cost to 15 cents, a saving of 5.7 cents per ton.

The charges for interest on investment and depreciation are fixed costs, but by increasing the number of operating days to 75 per cent and increasing the tonnage to 3 tons per day, a saving of \$219.73 on the above equipment can be made each year.



## CHAPTER IX.

### DELIVERY EQUIPMENT.

**Good Equipment Essential.**—First-class, up-to-date delivery equipment is just as essential as the same grade of equipment is necessary to produce good, merchantable ice.

It is possible to manufacture ice with an obsolescent, run-down refrigerating plant, but the quality of ice usually is inferior and the cost very much higher than with a modern up-to-date plant.

Ice can be delivered in old, dilapidated wagons, drawn by scrawny, wornout horses, with harness held together by hay wire. But it cannot be delivered economically any more than it can be produced economically under like conditions.

There is another important point to consider. An up-to-date, efficient ice manufacturing plant is seldom visited by the general public. The public does not have to move a step to see delivery equipment. It is at their door every day. It traverses the streets of the city or town in view of all the populace daily.

The standards of a business are gauged very largely by its methods and its equipment. Loose, unbusiness-like methods in dealing with the public are usually reflected in a poor class of equipment, or vice versa.

The advertising value of good delivery equipment is also to be considered. Clean, well-painted wagons and trucks, well-groomed horses, bright, well-made harness, and uniformed delivery men will do much to increase the respect of the community for the ice company that has such equipment.

**The Horse.**—How many draft horses are practically ruined during their first year of service by careless and incompetent drivers?

There is probably no real authentic record, but the estimate could be placed at 22% and the average would be a fair one.

The driver of today has no doubt progressed somewhat in handling and caring for his team over the driver of several years ago, but there is still plenty of room for improvement if he would only stop to consider that a horse, like a man, has only a certain degree of endurance and that a little common sense on his part would preserve the functioning powers of the animal longer and with greater satisfaction to his concern. Careful and attentive drivers are a big asset to the firms who employ them for the reason that their proper handling of the stock increases their efficiency and years of labor, thereby saving their employers many thousands of dollars annually in replacing worked-out animals with new stock.

There is a certain percentage of drivers who are shiftless, careless and unconcerned and whose only concern is to pull away from the barn in the morning and gallop the team home in the evening for fear they will work five minutes overtime.

Men of this caliber are not wanted by corporations and others because they are a detriment to the concern's business as well as "horse killers," to use the common phrase of drivers who do take care of their stock, and who take an interest in the firm's business.

**Care in Selection of Stock.**—When it becomes necessary for the ice dealer to purchase one or more horses he confronts a problem as difficult to solve correctly as any he has to contend with. This, despite the fact that he may at the time consider it a more or less trivial incident in his business. However, if he makes a bad selection he suffers a financial loss entirely out of proportion to the mere amount of money invested in the horse. This loss may be immediate, or if the horse is not adapted to the purpose for which he is bought he may be the cause of small and continued losses long drawn out, until he is replaced by an animal suitable for the work to be performed.

A few of the questions to be considered in purchasing a horse

for the ice business are soundness, age, conformation, disposition and price. These are not nearly all the questions which may be considered with profit in selecting a horse, but they cover the main points pretty well.

It is not essential that the horses be perfectly sound—that is to say, without a blemish. Horses having a defect such as the loss of an eye or some other imperfection which does not in any

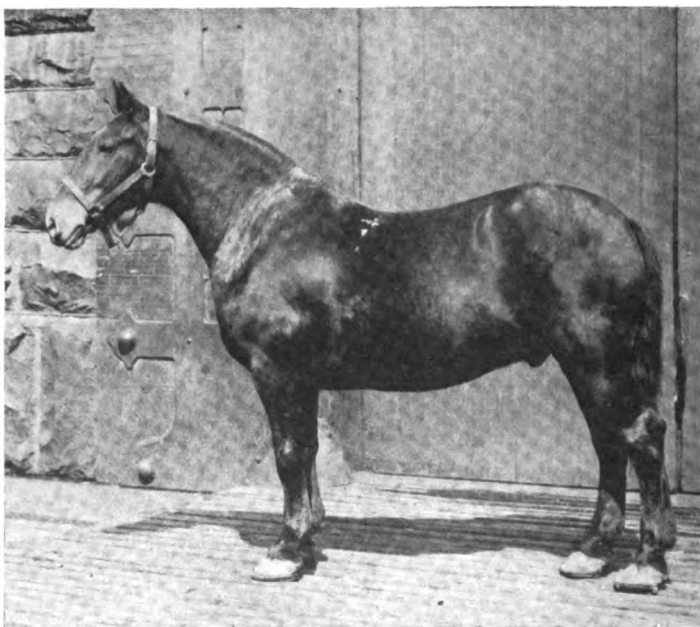


FIG. 32.—GOOD TYPE OF HORSE FOR ICE DELIVERY

manner interfere with their work can often be bought at a price very much lower than the horse without a blemish, and are no wise less serviceable than the higher priced animal.

In purchasing either horses or mules those ranging in age from six to eight years are preferable, although it is true that mules are usually worked at an earlier age than horses. It is not advisable to purchase a horse until he has shed his colt teeth, which is usually at the age of four or five years. A horse that is physically sound at the age of six or seven years usually remains sound, barring accidents.

The horse illustrated in Fig. 32 is considered a good type of horse for ice delivery work. This horse has been in the service of the American Railway Express Co. for 13½ years; height 16.1 hands and weight, 1,550 pounds. Photograph furnished by Horse Association of America.

The stocky, closely coupled horse is certainly to be preferred to that of any other build. Horses weighing 1,400 to 1,500 pounds for one-horse wagons, and horses of about 1,300 pounds each for two-horse wagons, hauling loads of 6,000 to 7,000

THE CITY ICE DELIVERY CO.		<u>HORSE RECORD</u>	
DATE _____	190__	HORSE No. _____	
BOUGHT OF _____			
AGE _____	SEX _____	HEIGHT _____	PRICE _____
WEIGHT _____		COLOR _____	
MARKS _____			
_____ 190__		PLACED IN SERVICE AT STA. _____	
_____ 190__ Transferred to Sta. _____		_____ 190__ Transferred to Sta. _____	
_____ 190__ Transferred to Sta. _____		_____ 190__ Transferred to Sta. _____	
_____ 190__ Transferred to Sta. _____		_____ 190__ Transferred to Sta. _____	
_____ 190__ SOLD TO _____		PRICE _____	

FIG. 33.—GOOD FORM OF HORSE RECORD

pounds. Cities with mud street or hills would probably need heavier teams than cities not having those conditions.

The disposition of the horse is really of some importance to the ice dealer. One stupid, fractious, ill-natured or balky horse or team will very often upset the organization of barn and drivers. It is certainly poor economy to knowingly buy a draft animal having any of those faults, no matter how cheap the price. Or having bought one unknowingly, to keep it any longer than necessary to pass it on to the man who knows he has a driver who can make a model horse of it.

All horses should be numbered and an accurate record kept of them. One of the best methods of numbering is to brand

the number on the hoof with stencils. A very good form of horse record is shown in Fig. 33.

Another form of report is shown in Fig. 34.

**Feeding.**—The feeding of stock is one of the very large items of expense in delivery operation. It is a subject that is given very little attention, and, therefore, the waste is enormous. Large sums of money are lost yearly by feeding of horses and mules through the useless waste of feed itself. The amount of

HORSE REPORT				
CARD NO. _____				
PARTICULARS				MARKS
NO.				
SEX				
AGE				
HEIGHT				
COLOR				
WEIGHT				
BOUGHT FROM				
PRICE PAID				
DATE BOUGHT				REMARKS
SOLD TO				
AM'T REC'D				
DATE SOLD				
DIED AT				
DATE				
CAUSE				
INVENTORIED				
AT				

FIG. 34.—FORM OF HORSE REPORT

money lost, however, is not the only thing to be considered in that connection, for it is the improper feeding that is the cause of sickness, disease and death among the stock. The time lost by stock being laid up through sickness is a serious item to both the large and small company.

Many men when questioned as to the amount of feed they give to their stock will say: "I give my horses all the hay they want and all the grain they will eat up clean." Likely as not the

horse owner who makes this remark takes considerable pride in it, and rightfully so, because he thinks he is treating his horse just as he himself would like to be treated. But he forgets for the moment that he is not a horse, or, properly speaking, the horse is not human. In no other particular does the horse more closely resemble his human friend than in the habit of gorging and overeating. The horse has, however, a reasonable excuse—he cannot reason for himself, and, because of his long association and dependence on man, he has lost to a great extent the keen instinct which he was originally endowed by nature.

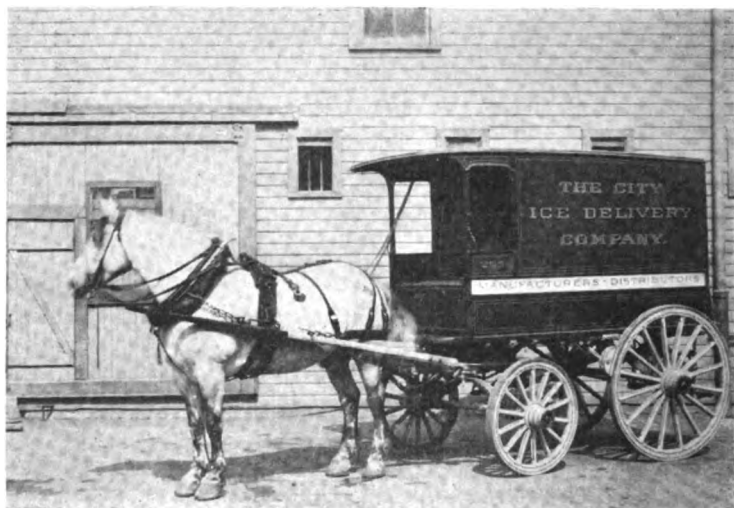
More horses are overfed than underfed. More sickness is caused by injudicious feeding than from any other cause. If it were proper to allow a horse to eat and drink all he wanted, there would be no case of founder caused by overeating or overdrinking. No one would knowingly allow a valuable animal to have free access to the corn crib or oats bin; allow him to eat all he wanted, and take the chance of his stopping just at the right time. Showing that after all the belief that a horse should eat all he desired to eat is not adhered to strictly; no systematic effort is made to learn whether the amount fed is too much or too little.

Muscle flesh is one thing, fat is another. Fat is generally a disease. Dr. Page, in an interesting little book on horses, gives an example of a six-year-old, fat, chunky mare, imported from Canada, who it was predicted would have the stock fever as a matter of course. He fed her only one meal per day for two weeks and drove her from ten to twenty miles every day, including Sunday. Her meal was a generous feed of hay and four quarts of oats each night. After two weeks she was driven about twenty-five miles a day, and two quarts of oats in the morning were added to her daily feed. In six months her weight, which had fallen off rapidly at first, was only twenty-five pounds less than originally. One hundred pounds of fat had been exchanged for seventy-five pounds of muscle.

A work horse pulling a light load rapidly will use up more energy than he will in pulling the same load slowly, and if fed the same in both instances will lose weight when driven rapidly.

Inquiry among horse owners developed the interesting fact that cases of colic occurred more frequently on Sundays or on holidays than any other time, and in each of these instances it was equally interesting to learn that the rule in these barns was to feed the same quantity of feed on Sundays or holidays as on other days.

Professor Henry, in his book on "Feeds and Feeding," states that the mettle shown by a horse fed on oats led to the supposition some years ago that this grain contained some stimulating



DELIVERY EQUIPMENT WHICH ATTRACTS ATTENTION

principles. One chemist, in 1845, separated an albuminoid from the grain which was termed Avenine. Later work of chemists did away with this discovery; and still later another chemist claimed to have found the stimulating principle of oats in the seed coats of the grain. But again, as before, further, and presumably more careful, chemical examinations exploded this theory. And yet, Professor Henry says, horsemen still agree that there is something in oats which is stimulating to horses outside of its value as mere food.

There are several good reasons for feeding oats. All authorities agree that they are easily digested and contain the nec-

essary amount of protein to supply food for the muscles. That even the hull has its value in furnishing a sufficient amount of roughness to aid in exciting the saliva and gastric juices and thus aids the digestion. Many careful and experienced feeders prefer corn as the principal grain and oats only as a change. There can be no question as to the value of corn in fattening a horse, and it is certainly a much cheaper feed than oats, but many experienced stockmen are of the opinion that corn-fed horses are more susceptible to disease, and even though they present a pleasing appearance, have not the muscular strength, the endurance or the power to as readily resist diseases as horses fed on oats.

Horses suffer from indigestion when they are fed irregularly or improperly and not given the proper time to eat. A horse's stomach is just as sensitive to injury as is a man's if he is fed when he is tired or worn out. Competent authorities agree a horse should not be fed grain when he first comes in. He should be given a little water and then some hay. After standing a while, half an hour or so, he is then ready for his feed. After eating the grain he should have some time to stand and rest before he has to go to work. Not all horses should be fed the same quantity; some eat more than others. Oats are considered the best possible feed, and it is believed well to vary it sometimes with corn, three to four times a week, or perhaps once a day.

Constant changing of the kind of feed is not good for the horse. Horses can be fed on oats, corn, hay and bran the year around and good results obtained if they are supplied with plenty of water and salt. However, it is advisable not to give the salt in the feed, but keep it where they can get it at will. There are other feeds that can be fed regularly with just as good results, but care should be exercised in using them so as not to give them feed that is too laxative or too constipating, as such feeds tend to produce colic. In a healthy horse, the same as in a healthy person, the mouth, stomach and bowels furnish the right secretions to keep the organs working properly.

The consensus of opinion favors the crushing of oats and the cracking of corn before feeding, for the reason that some horses have poor teeth and most of them bolt their food. Stablemen



are not always punctual in their hours of feeding, in the morning particularly, and consequently drivers take their horses out before they are through eating. Very many drivers do not give their horses sufficient time to eat when feeding the noon meal on the street, therefore, horses have learned to eat hurriedly so as not to leave any feed. Whole oats and whole corn do not do horses any good by just taking a trip through them.

Care should be exercised in the kind and quality of feed used. Only the best white oats should be fed, and they should be thoroughly screened, which will minimize colic cases. The hay should be good timothy, free from weeds, and **sweet** above all things. Corn should not be fed in hot weather nor shelled corn at any time. Corn is considered better for supper than breakfast.

A rule that is pretty generally followed in many sections, is to give horses a bran mash with a little pure salt instead of grain on Saturday nights. This has a tendency to cool the stomach, especially in hot weather. Where horses are fed three times daily, they should receive but two meals on Sunday, morning and night, with hay about noon, water after morning meal and in the afternoon before night meal.

There is a heaping teaspoon of salt in every quart of a horse's blood, and enough salt must be fed to maintain this proportion. Rock salt should not be fed because it contains potash. Only pure salt should be used, and usually as much as the horse cares to eat, except that a horse that has been deprived of salt should be brought gradually to the point where he can take all he wants.

To make it possible for horses to derive all of the benefit possible from their feed, their teeth should be gone over every year or two and any projecting and unequal points filed off. This work should be done preferably by a veterinary dentist, or if such is not available, a good veterinary. An indifferent job of filing would better have been left undone. Care should be taken not to smooth off the teeth so the horse cannot chew.

There is a scientific way to feed horses, but it requires close attention.

The subject of feeding has not been given the consideration which it should receive in view of the value of the horse, not

only in a monetary way, but in his efficiency and ability to perform the work which he is compelled to do.

The United States Department of Agriculture, in Farmers' Bulletin No. 1004, states that in computing the rations for work horses, no one feed or combination of feed will meet conditions in all parts of the country, and generally speaking, the crops grown locally constitute the most economical ration. Substitution may often be made in rations in such a manner, but while the efficiency remains unchanged, the cost is materially lower. Selection of the most economical and suitable rations are governed largely by local conditions. The bulletin gives the composition and net energy value of various feeds, and the following method of computing rations based on the requirements of work:

Rations containing the following amounts of digestible protein and of net energy value may be used as a guide in computing daily rations for the 1,000-pound work horse under varying conditions:

Kind of Work	Digestible protein Pounds	Net energy Value Therms
For light work.....	1.0	9.80
For medium work .....	1.4	12.40
For heavy work .....	2.0	16.00

From 16 to 25 pounds is a fair average of dry matter for the 1,000-pound horse, depending on the amount of work performed. Following is an example in computing a ration that will meet approximately the needs of a 1,000-pound horse or mule at medium work:

From the table above we know the requirement to be 1.4 pounds digestible protein and 12.4 therms of energy. A reasonable estimate for grain is that about 1 1-10 pounds per 100 pounds live weight is required, which would make a total of 11 pounds of grain daily for a 1,000-pound horse. A reasonable estimate for the amount of roughage is 1 1-5 pounds per 100 pounds live weight, which makes the requirement about 12 pounds of hay daily.

The next step is to list the available feeds: in this case let us assume that shelled corn, oats, alfalfa, and timothy hay are available. The composition of each of these feeds is as follows:

## ICE DELIVERY

Kind of Feed	Class	Composition		Net energy value Therms
		Dry matter Pounds	Digestible true protein Pounds	
Corn	Carbohydrate	89.5	7.0	85.50
Oats	Protein	90.8	8.7	67.56
Timothy	Carbohydrate	88.4	2.2	43.02
Alfalfa	Protein	91.4	7.1	34.23

The desired object is to combine the feeds so that the total nutrients will be 1.4 pounds digestible protein and 12.4 therms of energy. The estimated amounts of grain and roughage are merely guides.

We first make a rough estimate of the amount of each feed necessary; then calculate the actual nutriment in the estimated amounts; and, lastly, make reductions, additions, or substitutions to the ration so that the total amount of nutrients will be very near 1.4 pounds of protein and 12.4 therms of energy.

For a trial ration let us take 7 pounds of oats and 4 pounds of corn for concentrates and 6 pounds each of alfalfa hay and timothy hay for roughages. According to the analyses, 100 pounds of oats have 8.7 pounds of true protein and 67.50 therms of energy. In our trial ration we are using 7 pounds of oats, which is 7-100 of 100 pounds. Multiplying 8.7 and 67.56 by 7-100, we find that in 7 pounds of oats there are 0.609 of a pound of protein and 4.7292 therms of energy. By similar use of the table we can determine the nutrients in the other feeds used in the estimated ration as follows as a trial ration for a 1,000-pound horse or mule at medium work:

Ration	True protein. Pounds	Energy Therms
7 pounds oats .....	0.609	4.7292
4 pounds corn .....	.280	3.4200
6 pounds alfalfa hay .....	.426	2.0538
6 pounds timothy hay .....	.132	2.5812
Total .....	1.447	12.7342
Theoretical requirement .....	1.4	12.4

The computed ration is satisfactory in filling the theoretical requirements and has a slight margin of surplus. This is close enough for practical purposes.

If, in computing the nutrients in an estimated ration, the

amount of protein is found to be low and the amount of net energy is high, there should be substituted a feed comparatively high in protein and low in energy; thus alfalfa hay sometimes may be substituted for timothy, or wheat bran may replace part of the corn in a ration.

It is not satisfactory to depend wholly upon grains and other concentrated feeds for furnishing nutrients to horses; neither will it do to provide only roughage. The horse has a relatively small stomach and can not take care of great quantities of coarse non-nutritious feed, but there must be sufficient bulk to the ration to make normal the process of digestion. Both concentrates and roughages are necessary.

The quantity of feed for the work horse depends on the amount of work done and on the speed at which it is performed; a horse requires considerably more feed when working at the trot than at the walk. As before stated, it is a good rule to allow 1 1-10 pounds of grain and 1 1-5 pounds of hay per 100 pounds of live weight for horses at moderate work. At this rate a 1,200-pound horse would require 13 pounds of grain and about 14½ pounds of hay per day. If the work is severe, the quantity of grain should be increased. The horse at hard work requires 1¼ to 1⅓ pounds of grain per 100 pounds live weight; the hay fed, however, should not be over 1¼ pounds per 100 pounds live weight. The exact quantity will depend largely on the individuality of each horse.

Further on in this chapter, under the head of "Barn Expense," there are shown actual figures as to the amount of oats and hay fed per horse for two years by a company owning nearly 300 horses. It will be seen by that table that the grain ration is approximately the proportion set forth above, but that the pounds of hay fed is much larger.

As indicative of the variety of opinion as to the feeding of horses, the following descriptions of the manner, kind and amount of feed used from several of the larger cities of the country are reprinted from an article by H. W. Dithmer, published in *Ice and Refrigeration*:

*New York City*.—Six quarts of heavy white oats (crushed) three times daily and 7 to 8 pounds of hay, except Sunday. Horses watered before eating and are made to stand half hour at noon before being fed. Sunday feed two meals, using "Corno" instead of grain.

*New York City.*—Eight pounds crushed oats and 5 pounds hay three times daily except when idle as on Sundays, receive less feed and one mash.

*Brooklyn, N. Y.*—Six pounds of crushed oats three times daily and 18 pounds hay when working; 5 pounds crushed oats three times daily and 18 pounds hay when idle. Horses are watered before eating and required to eat hay one hour before being fed at night.

*Jersey City, N. J.*—Sixteen pounds crushed oats per day—6 pounds morning and night and 4 pounds at noon. Eighteen pounds prairie hay daily, 8 pounds in morning and 10 pounds night.

*Hoboken, N. J.*—Feed entirely according to work done—as little as 2½ pounds of crushed oats, at other times 4½ pounds crushed oats three times per day—two feeds on Sunday and holidays.

*Newark, N. J.*—Seven pounds crushed oats three times daily and 16 pounds hay once a day, except two meals each week, when cut hay and mixed feed is used. Two feeds of grain on Sundays or holidays. Usual allowance of hay.

*Philadelphia, Pa.*—Three pounds ground corn and 2 pounds crushed oats three times per day and 12 pounds hay. Hay is fed at noon.

*Cleveland, Ohio.*—Fifteen pounds of oats, 2 pounds bran, 15 pounds hay and all salt they want (one-half this amount when idle). Experiments with mixed feed composed of rolled oats and cracked corn mixed with molasses and bran, fed dry, shows a saving of 15 per cent in cost compared with pure oats.

*Detroit, Mich.*—Two and one-half pounds rolled oats and 2½ pounds cracked corn three times daily. Sixteen pounds hay per day, dampened with one part of molasses and three parts of water. Also feed with night feed ¼ pound ground flaxseed with all the oil. Horses weigh from 1,400 to 1,800 pounds. Horses are watered before eating morning, noon and night; also at midnight in summer. Horses allowed to stand fifteen minutes before feeding at noon.

*Chicago, Ill.*—Eight and one-half pounds whole oats at noon and 3¾ pounds Peerless Feed each night and morning—27 pounds hay at night when working (only two feeds, each 4 pounds on Sundays or holidays). Horses must stand to hay two hours before eating grain at night. Water before feeding noon and night and after feeding in the morning.

*Milwaukee, Wis.*—Six pounds of crushed oats three times daily, occasionally mixture of bran and 4 pounds first-class feeding hay at night on working day or busy season, but only two meals of 4 pounds oats each and one meal of some kind of soft food in winter months for horses which only work every other day; water and rest before eating at noon, no water after eating.

*Kansas City, Mo.*—Twenty-one pounds grain daily, divided into three feeds of 7 pounds each. One pound of alfalfa (mixed feed composed of ground alfalfa and molasses), 2 pounds corn chop, 2 pounds barley chop and 2 pounds oats. Twenty pounds choice prairie hay per day. Horses not worked in winter given two feeds of grain and timothy and clover mixed with hay. Horses watered before eating and at midnight during summer.

It will be noticed that all feed three meals daily, except on Sunday, and very little mixed feed is given. In the south and southwest, mixed feed is used very largely, and but one meal a day. That is due partly to the fact that mules are mostly used. However, where the stock is mixed there is no change; all are treated alike. The stock do as much work, and probably a little more, owing to poor road conditions, as stock in other sections, and will compare favorably in appearance with stock used in similar work elsewhere.

**Care of the Horse.**—In the care of the horse, the most important items to be considered are feeding, shoeing, driving and stabling. All of these are important, and on all of them depends the health and service of the stock.

In putting green horses into service, care should be exercised in fitting them with collars, and that the hames are properly adjusted. Hames, improperly adjusted, will cause sores that may lay the horse up for months. Where pads are used, especial care should be taken to see that they are perfectly clean. Green horses when put to work should not be started out with a heavy load. An empty wagon is best to start with. They should not be given in charge of a driver who has a bad temper, as many a good horse has been ruined by unnecessary use of the whip and abusive language. They should be handled easily and gently, watered often, as a green horse is always feverish with new work. A green horse should not be worked when sickness is apparent and they should not be stuffed full of medicine without professional advice. A veterinarian should be called when fever is imminent, as prompt treatment will often prevent a long illness and possibly death.

Watering and cleaning are two of the most important things in the care of horses. Horses probably get more water in the morning and evening than is good for them, but during the day, usually they do not receive the amount of water they should. Horses should be watered frequently in small quantities during the day. Each driver should be furnished with a bucket and it should be part of the foreman's duty to see that the horses are watered at least twice a day, in addition to what they get at the stable. It has been proven that if a horse is

offered water often there is little danger of his drinking too much no matter how hot he is.

Cleaning of horses is one of the things that is very much neglected. In most companies the drivers are required to clean their horses and they simply rub the currycomb and brush over them as quickly as possible. Horses should be thoroughly curried, which removes the dirt, stimulates and opens the pores of the skin, so that nature may take its course and throw off the waste from the system. Hair on fetlocks, which nature put there for a purpose, should not be trimmed, but should be kept clean, and when washed, well dried before the horse goes out.

The front feet should be watched for the first sign of founder. By so doing it is possible to catch an acute founder and cure it before it becomes chronic, which cannot be permanently cured.

When horses are harnessed, care should be taken that the collar and hames are buckled up tight, as the loose collar and hames are the cause of most all sore shoulders. Neck yoke straps should be loose enough so that the horse does not have to carry the weight of the pole on his neck, as it will cause sore necks. Martingales and backing straps should be tight enough to allow the horse to back with his breeching instead of throwing the strain on his neck.

New horses that are green to the city and to the work should be watched carefully during the breaking-in period. Some horses are natural born workers and cause no trouble whatever, while others are inclined to be nervous. Such horses should be driven along side of a quiet horse, if possible, until they are city broken.

No horse should be left standing alone without being tied or weighted, as any horse is likely to get startled at some unexpected noise and run away. If this rule is followed, damage to the horse and wagon, the property of others, and danger to pedestrians will be greatly minimized.

In the winter time, many horses are constantly under the doctor's care because of carelessness on the part of the drivers. In many cases, this is not because the driver is willfully negligent, but because he does not give time to blanketing the team

properly. Many drivers when they stop to make deliveries, instead of placing blankets entirely over their horses, throw them folded on their haunches or hips with the idea of protecting the animal's kidneys. This is wrong and should be avoided. The horse should be properly covered, as he is just as liable to take cold in his chest or any other part of his body. As a rule the animal is more or less heated after making a haul, and when brought to a stop, should immediately be well blanketed before any attempt at unloading is made. If this rule is strictly applied, the driver and doctor will have less trouble doctoring the animal and as a result he will maintain a healthy condition throughout the winter.

Drafts are another element that drivers should be careful to avoid. A team should never be left to stand in a draft. If necessary, when unloading or coming to a stop, the driver should ascertain the best position to bring his team to with the end in view of avoiding drafts.

Care should be exercised in the winter time to prevent teams from skidding. At the time a horse skids or slips to the pavement, it may not appear to the driver to be a serious matter, but he should report it immediately upon reaching the stable. The injury may be trivial at the time, but if not given immediate attention, may grow into a serious mishap which might compel the horse to remain in the infirmary for weeks.

Trotting horses up hill is a great failing among many drivers. Fearing they will get stuck on an incline, they start their team at a dead gallop at the foot of the hill which is absolutely against all rules for the treatment of stock. The excuse given for this practice is that their load was a big one. Overloading should not be permitted. The team with its stipulated load, especially when the streets are snow laden, has plenty to do in getting over the ground without overtaxing them.

One important feature for the driver to follow during the hot weather is to watch his horses when they stop sweating. When an animal stops perspiring it is the first sign of heat exhaustion, and the driver should immediately take steps to put his team in a cool, shady spot where a hose is obtainable, and flush with plenty of water. This method should be carried out for at least fifteen or twenty minutes. If drivers will see that their horses get water and plenty of it, no matter how



much they are sweating, and will be considerate in driving during the hot day with an occasional stop in the shade to allow them to cool, they will experience little difficulty in keeping their stock in good working condition.

If a horse is subject to colic, the best thing is to prevent it by careful feeding. In all bad cases of colic, a veterinarian should be called immediately; the ordinary barn man is not competent to handle it. The veterinarian can also recommend the proper feeding of the horse to prevent colic.

Horses cannot be saved from sunstroke by sticking his ears through a straw hat which is positively harmful for want of ventilation. When a horse shows signs of being overcome by heat, the drivers should immediately get him in the shade as soon as possible and apply ice to head, neck and rectum, then douse him with water all over body and cover him with blanket to keep sun from burning him after the water is put on. A competent authority recommends that he be given one ounce of aromatic spirits of ammonia in one pint of water to strengthen the heart.

Horses that are shy should be treated with care, and no whip should ever be used. Shyness may be caused by fear, or it may be from defective eyesight. If the former, gentle means should be used to get him used to the trolley, automobile, and other things which startle him and arouse his fears. If shyness is caused by defective eyesight, it is deemed impossible to cure him.

Drivers should be instructed to keep an eye out for women who think they are doing a kindness by feeding the horse whole apples, as they may cause a horse to choke to death. However, don't forget the value of apples as a laxative and an excellent food for the horse, but all apples should be broken in two at least, before giving them to the horse.

Drivers should also be instructed to avoid the public watering troughs, which are too often used by diseased horses and generally are unclean. Horses should not be permitted to break through ice to drink in winter time. It is not good for their stomachs.

One of the most common troubles with horses engaged in ice delivery is shoulder galls. A well-known authority recommends that they should be washed with salt and water at

night, and the next morning washed well with clean water. If skin is broken, a lotion composed of a dram of carbolic acid to one quart of water be applied a couple of times a day. Another remedy for galls is a solution made of 4 ozs. of powdered alum, 2 ozs. of tanine (powdered white oak bark),  $\frac{1}{2}$  pt. of witch-hazel, applied two or three times a day. It is also advisable to keep the horse in for a day or two, as it is better to lose the use of the horse for that short time than to have him laid up for a much longer period.

Horses should be clipped at any time when the hair becomes long, for if they come in soaking wet, they cannot be dried out in a night and the wet hair is worse than the clipped. Indiscriminate clipping is not advised, for many times horses need blanketing instead of clipping.

Driving with covers on and the use of sweat collars should be avoided as much as possible.

For horses suffering from "scratches," which is a cracking of the skin, it is advised that the cracks be seared and the wound thus formed allowed time to heal.

For sprains, bruises or general lameness, iodine is recommended night and morning until the hair steams and gets sweaty, then apply sweet oil.

To locate lameness, mix one pint of flour and three pints of water to make a thin paste. Apply over the shoulder and down over the leg to the hoof and watch for the spot that dries the quickest, then wash the spot and apply the iodine.

To care for a nail in the hoof, it is recommended that wing feathers from a chicken be obtained, the ends cut off leaving them about the size of a six to ten penny nail and the quill cleaned out. After extracting the nail from the hoof, force one of the quills into the hole the depth the nail went in, fill the quill with iodine and work it through the end with a straw or match, at the same time drawing out the quill until the hole is filled with iodine, then place cotton in the hole.

Better no blinders at all than have them flapping loosely against horse's ear or endangering eyes with broken hold-straps on them.

One of the most common diseases among horses used in ice delivery is cramps. If a horse is laid up in the stable for three or four days and then taken out and driven several miles,

he is very likely to get "Azoturia." This disease affects the spine. It is a hyper-nitrogenous condition of the blood and system generally, due to overfeeding and overwork. It shows itself by tonic spasms of the gluteal muscles of the posterior extremities indicated by severe pain, increased perspiration and loss of motion of both hind legs. The nervous system, however, is not affected. It is almost entirely due to a general change of circulation of the blood.

Any treatment is very unsatisfactory in this disease, especially if it is in an acute form, which it generally is. It attacks only the best horses, as the animal must be in a plethoric condition in order to be subjected to it.

The preventative treatment, however, is positive, and there is no reason for any horse to be taken with this disease if the management of a stable is careful of horses that have been worked hard and are in a high condition and laid off for two or three days. It should be an ironclad rule that all such horses are thoroughly exercised previous to being put to work, and above all that horses laid off in this condition have their feed cut to just half the daily ration.

Always be kind to a sick horse, provide a nice airy and clean stall free from draft and by all means, be punctual in giving medicine, following doctor's instructions implicitly. Do not feed in large quantities to a sick horse, but keep up his appetite by every means. Feed small quantities, change often.

**Shoeing.**—Horses often suffer most cruelly because of the ignorance of horseshoers. Corns and contracted feet are generally caused by improper shoeing. The common remedy prescribed by many horseshoers for almost every ailment of the horse's foot is the bar shoe.

The bar shoe, properly made, is without doubt beneficial to a horse with contracted hoofs, but unfortunately, in too many instances, the bar shoe is made wrong and put on wrong, and fails to correct the trouble for which it is intended. It is, therefore, all important to employ a horseshoer who knows how to cure a defect in a horse's foot, or what is more to the point, one who has sufficient pride in his work and the skill to prevent the lameness and suffering such as is often caused by the inefficient horseshoer.

As to the care of the horse's hoofs, attention should be given to the shoeing of them to see that the shoes are properly fitted to the hoof and provided with calks as sharp as consistent with the work to be done. A horse's hoof is naturally coated with an oil that will keep the hoof from getting dry and cracking, but if the blacksmith is allowed to rasp off the varnish, trouble is liable to ensue. Very little paring should be allowed on the sole—keep them cut away consistent with his work.

Horses coming in from the country to the city should be shod plain all around; have flat toes behind and no heels. If shoes are driven on too hard they should be taken right off again to give relief.

**Driving.**—The best horse, properly fed and shod and under otherwise favorable circumstances, can be ruined by improper driving. There are a great many ways of driving improperly. A heavy draft animal is injured more from trotting rapidly a short distance with an empty wagon on a paved street than he is by hauling a heavy load slowly ten times the distance and given a moment's rest occasionally to get his wind. A draft horse should not be driven rapidly at any time and especially not immediately after a big meal. This last instance applies to a driving horse as well as the draft animal. Driving a team properly requires some knowledge other than "Git up" and "Whoa" and "Gee" and "Haw." It is not difficult to detect the real driver from the counterfeit.

When you notice a man climb up into the seat, gather his lines up tight, and speak encouragingly to his team, when he expects them to move a heavy load, you somehow feel confident that this driver and his horses understand each other perfectly, that the driver knows his horses will start the load and the team seem somehow to have full confidence that their driver will not urge them to do the impossible.

Let us watch this same team when another so-called driver climbs upon the seat. He commences clucking the horses before he has gathered up the lines which are hanging loose. In all probability there is a calk under the wheels which he put there himself when he started to load his wagon at the platform. He has either forgotten it or doesn't care and fails to

remove it before he gets ready to drive out with his load. But let us watch the team again. Being perfectly well broken, they understand that they are expected to pull even though the driver speaks in a half-hearted way, or worse, strikes them with a whip without first speaking to them. The team quickly notices the difference in drivers, especially so when after hearing the strange and uncertain voice they find the load pulls



GOOD TYPE OF SUPPLY EQUIPMENT

harder and heavier than it ever did before, and they are left to pull and struggle as best they can with loose line. The team has commenced to lose confidence in themselves, and in their driver, and it will not be many days before the new driver will be complaining to the stable man about the poor horses he has and wanting to know if he can't exchange them for a good team that will pull.

Do some horses really become slackers or is their indifference due to the drivers?

By slackers is meant where one animal of the team becomes laggard and lets his mate do most of the pulling. There is hardly a driver who has not seen at one time or another a

team with one horse a head and a half in front of the other drawing a load.

Now this condition should not exist and is up to the driver to remedy. Either he is careless in adjusting his traces or else he is allowing one of the animals to impose upon the other. If he paid more attention to the shirking horse by urging him with the line (a whip is not necessary) he would no doubt get results that would equalize the drag. If the traces are not properly hitched it throws the team off balance and looks neglectful on the part of the driver.

**Selling Surplus Stock.**—Unfortunately for the ice dealer, in the spring when he increases his stock of horses, anticipating his summer business, the price of horses is the highest, and in the fall when he can dispense with the services of a number of his horses he finds the selling price discouragingly low. Many men contend it does not pay to sell a good serviceable horse in the fall than was paid for him originally, which is quite accustomed to the work, even though one got a little more in the fall than was paid for him originally, which is quite unlikely. A pretty safe rule to follow is to sell any horse that has become unserviceable on account of a balky disposition or because he has contracted feet, or side bones, is either heavy or windy, or has any other ailment, the cure of which is questionable and will at the best be long drawn out. On the other hand, it is not advisable to sell a good sound horse just because he has reached the age of twelve or thirteen years, neither is it a good idea to sell a good horse because he has a temporary and curable ailment which may lay him up for a few days.

Intelligent care, proper feed and watering, careful driving and kindness will save the life of many a horse and prolong his usefulness. By nature the horse is gentle, tractable, especially when broken in by kindness, and responds promptly to a gentle voice as if its melody pleases him; note how his ears point forward at the first sound of a gentle voice, whether a familiar one or not; note the vigor with which the ear muscles snap back when startled by a harsh angry voice or the cruel lash; the crack of the whip may at times be wise but the lash of it on his back never. Speak to him in Gaelic, Yid-

dish, English or any language; he understands neither, but the tone is what he interprets with quick intelligence. The word of praise, the gentle touch of a patting hand makes him your friend and your servant.

**The Barn.**—After a hard day's work, a horse is justly entitled to a place in which he can eat his feed in peace and comfort and a nice dry stall, well bedded, in which to rest. In building barns, wide gangways should be provided. Single stalls should be five feet wide, double ones nine feet. Horses should have plenty of air and light without draft. There should be window lights to each stall and sashes hinged, but set high enough to keep draft from horses' heads.

The stall floor should be well drained and level, so that the horses' hind legs will not be strained by standing on an incline.

In all barns it is advisable to have one or two box stalls away from the others in which a horse that is sick can be placed. These stalls should be especially well ventilated so that a horse having an infectious disease can be kept there without danger of getting infection to the other horses. It is also advisable, where it is possible, to have an open lot and turn horses into it from time to time to exercise. Such space is an absolute necessity where mules are used.

The cleaning up of the stalls each morning so that the barn can be aired and floors thoroughly drained is a very important factor in the welfare of the horse.

The careful keeping of a feed inventory is also a very important detail. Feed represents a large expenditure of real money and should be regarded as such. Feed boxes and feed and hay storage bins should be kept locked at all times. This not only prevents theft, but assures feeding only by the man to whom that duty is delegated.

When a barn needs repairs, horse collars need fitting, numbers on horses' hoofs become indistinguishable, an animal does not seem to be doing well on account of excessive mileage, poor mating in teams, and other conditions, it is the barn man's duty to immediately report same to the official in charge of barn.

**Barn Expense.**—In order to know what it costs to feed horses it is necessary to have some form on which the barn man

BARN REPORT												
Location.....		For Month Ending.....191...										
Day	NO. OF HORSES		NO. OF SHOES		LBS. RECEIVED							Day
	In Service	In Barn	New	Reet	Oats	Corn	Brn	Straw	Hay	Oil Meal		
1												1
2												2
30												30
31												31
TOTAL												
On Hand 1st of Month												
TOTAL												
Less on Hand End of Month												
Used During Month												

Details to be filled in at Main Office

Average No of Horses for Month.....

Average Lbs of Feed per Horse per Day.....

Oats	Corn	Brn	Straw	Hay	Oil Meal
.....	.....	.....	.....	.....	.....

BARNMAN .....

SUPT. ....

FIG. 35.—FORM OF BARN REPORT USED BY LARGE ICE COMPANY



## ICE DELIVERY

can keep a record of the number of horses in service and idle, shoeing expense and feed received.

The form illustrated (Fig. 35) is used by a company operat-

TABLE XVII.—POUNDS OF OATS AND HAY FED PER HORSE  
AUGUST 1916-1917

BARN	OATS		HAY	
	1917	1916	1917	1916
B.....	17.5	16.5	26.0	24.0
P.....	17.5	17.0	21.5	18.0
H.....	17.0	18.5	27.5	12.0
A.....	13.0	15.0	23.0	23.0
H. S.....	15.0	18.5	24.0	17.5
E. N.....	14.0	21.5	29.0	21.0
E. S.....	16.0	22.5	25.0	22.5
C. L.....	16.5	3.0	20.0	45.0
T. L.....	....	15.0	42.0	20.0
S. O.....	4.6	15.0	32.0	20.0
H. O.....	13.0	....	32.0	....
B. A.....	15.5	....	26.0	....
Average.....	15.5	18.5	26.0	21.0

## COMPARISON WITH PRECEDING MONTH

1917	HAY		OATS		Total Cost
	Pounds	Cost	Pounds	Cost	
Aug.....	238,340	\$1,647.51	142,886	\$3,141.67	\$4,899.61
July.....	212,145	1,096.34	132,157	3,103.15	4,311.49
	+26,195	+ 551.17	+10,729	+ 38.52	+ 588.12

## TOTAL POUNDS HAY AND OATS USED AUGUST 1916-1917

1917	Hay 238,340 pounds	Oats 142,886 pounds
1916	Hay 158,735 pounds	Oats 149,286 pounds
	Hay +79,605 pounds	Oats -6,400 pounds

Average number of horses fed—1917.....296  
Average number of horses fed—1916.....276

ing twelve barns and owning approximately 300 horses. It does not require that the barn man be a clerk, as all he has to do is

to enter the figures in the respective columns. All clerical work is done at the main office at end of month.

In order to obtain results from this report it must be kept up and an inventory of feed on hand taken each month. The amount of feed on hand at end of month as shown by the inventory, deducted from the total of the amount on hand the first of the month and the amount received during the month, shows the amount used for the month.

The total number of horses in service and in barn, divided by the number of days of the month, gives the average number of horses for the month. The total number of horses divided into the amount of the various feeds used during the month will give the average pounds of feed per horse per day.

Companies operating more than one barn will find such a report of great value in decreasing feed costs, as it makes it possible to know the exact cost of feeding at each barn. Barnmen are usually careless and wasteful, and each has his own ideas as to the amount of feed a horse should have. With such a report it is very easy, by comparison, to know where the increase in the feed bill is.

The figures shown in Table 17 are a recapitulation from the various barn reports, comparing 1917 with 1916. It shows the average amount of oats and hay fed at each barn for the month, and averages for all barns. The amounts shown for 1917 are approximately the amounts used by the government.

In Table 18 is shown the total monthly stable expense of all items, cost per horse for month and the cumulative expense, the statement of horses working and the disposition of stable expense.

It will be noticed that feed is only 61 per cent of the total expense for the month. Attention is also called to the difference between the total cost for all horses and the total cost for horses working, a difference of \$11.73 a horse.

This difference in cost between all horses and the working horses is something to consider in figuring costs, as it is only the working horses that bring in any revenue. Idle horses are a dead loss.

Referring to the statement of horses working, it will be noticed that for May 0.692 per cent only were working. The cumu-

## ICE DELIVERY

TABLE XVIII—STABLE EXPENSE FOR MONTH OF MAY

	300 HORSES		1707 HORSES	
	May	Cost Per Horse	To Date	Cost Per Horse
Feed .....	\$4,849.43	\$16.16	\$23,649.85	\$13.86
Shoeing .....	359.97	1.20	1,950.51	1.14
Veterinary .....	44.35	.15	327.27	.19
Stable Light and Heat .....	24.46	.08	387.88	.23
Barnmen and Superintendent ..	1,049.50	3.50	5,774.29	3.39
Depreciation—Horses .....	677.05	2.25	3,985.02	2.33
Depreciation—Stables .....	194.45	.65	1,166.70	.68
Depreciation—Harness .....	163.04	.54	963.66	.56
Fire Ins.—Stable, Horses and Harness .....	262.85	.88	1,577.10	.92
Liability Insurance .....	38.40	.13	208.62	.13
Auto Expense .....	93.47	.31	451.43	.26
Miscellaneous .....	134.57	.45	314.38	.18
Total Cost .....	\$7,891.54	\$26.30	\$40,756.71	\$23.87
Horses Working .....		38.03		35.85

## STATEMENT OF HORSES WORKING

AVERAGE NUMBER OF HORSES	MAY		TO DATE	
	Horses	Per Cent	Horses	Per Cent
On Peddling Wagons .....	166	0.554	104	0.366
On Wholesale Wagons .....	13	0.043	4	0.014
On Coal Wagons .....	11	0.037	30	0.105
On Outside Teaming .....	5½	0.018	7½	0.026
On Driving Horses .....	5	0.017	5	0.018
On Harvesting and Packing .....			35½	0.125
On Loading Cars .....	7	0.023	3½	0.012
Total Horses Working .....	207½	0.692	189½	0.666
Total Horses Idle .....	92½	0.308	95	0.334
Total .....	300	1.000	284½	1.000

## DISPOSITION OF STABLE EXPENSE

	MAY		TO DATE	
	Amount	Per Cent	Amount	Per Cent
Harvesting and Packing .....			\$ 6,508.71	0.160
Cost of Ice (Car loading) .....	\$ 266.21	0.034	869.24	0.021
Delivery Expense .....	6,997.83	0.887	25,345.99	0.622
Coal Expense .....	418.33	0.053	6,345.32	0.156
Teaming Expense .....	209.17	0.026	1,687.45	0.041
Total .....	\$7,891.54	1.000	\$40,756.71	1.000

lative shows 0.334 per cent idle to date, a period of six months. Disposition of stable expense shows 0.887 per cent of the May total charged to delivery, while the cumulative is only 0.662.

Table No. 19 is illustrative of the fluctuating costs and the number of idle and working horses during the various months. This company handles mostly natural ice. It will be noticed that in December 46 per cent were idle; January, 19.6 per cent; February, only 16.2 per cent. In March the idle horses jump to 40.2 per cent, while August shows only 12.2 per cent are idle.

TABLE NO. 19. — SHOWING NUMBER OF HORSES, IDLE AND WORKING, FEED COST, TOTAL COST PER MONTH AND CUMULATIVE COST FOR PERIOD OF NINE MONTHS

MONTH	No. Horses	Per Cent		Feed Cost	Cost		Cumulative Cost	
		Working	Idle		Total	Working	Total	Working
December.....	266	54.0	46.0	\$11.35	\$21.40	.....	\$21.40	.....
January.....	271	80.4	19.6	13.96	24.41	\$30.34	22.92	\$34.04
February.....	287½	83.8	16.2	13.43	22.91	27.34	22.92	31.33
March.....	287½	59.8	40.2	14.76	25.10	41.95	23.48	33.73
April.....	295	52.4	47.6	13.20	22.90	43.65	23.36	35.34
May.....	300	69.2	30.8	16.16	26.30	38.03	23.87	35.85
June.....	300	80.5	19.5	14.68	24.36	30.26	23.95	34.85
July.....	296	83.8	16.2	13.99	23.91	28.53	23.94	33.87
August.....	296	87.8	12.2	16.61	26.74	30.45	24.25	33.43

CUMULATIVE COST PER HORSE FOR VARIOUS ITEMS OF STABLE EXPENSE

	Cost Per Horse
Feed .....	\$ 14.28
Shoeing .....	1.19
Veterinary .....	.18
Stable Light and Heat.....	.17
Barnmen and Superintendent.....	3.40
Depreciation of Horses.....	2.31
Depreciation of Stables.....	.67
Depreciation of Harness.....	.56
Fire Insurance on Stables, Horses and Harness.....	.91
Liability Insurance .....	.12
Auto Expense .....	.26
Miscellaneous .....	.20
	<hr/> \$ 24.25
Percentage of Horses Working to Date.....	0.724
Percentage of Horses Idle to Date.....	0.276
	<hr/> 1.000

Table No. 19 shows the total monthly cost per horse, also the cumulative cost each month of the various items of stable expense, shown in lower part of table, for a period of nine months.

This company employed its own horseshoers, and the shoeing cost per month, at the time these figures were obtained, was \$1.19 per month. Shoeing, however, is only one of eleven other items of expense, in addition to cost of feed, which must be included in order to know accurately what it costs to maintain one horse one month. It will be noticed that the expense of the automobile used by the barn superintendent is charged directly to barn expense and pro rated on each horse.

The chart shown in Fig. 34 portrays in a graphic manner the figures contained in Table No. 19. Especial attention is called to the difference between feed cost and total cost. This difference is made up of the items of cost as shown in the lower half of Table No. 19. These figures show that the feed cost is only 59.4 per cent of the total cost, therefore it is necessary in figuring costs to include that 40.6 per cent. From statements made by men as to the expense of maintaining a horse per month, it is evident that the 40.6 per cent is not included.

In Fig. 37 the chart shows the average feed cost per horse per month and cumulative cost for a period of five years. It illustrates the great advance in feed cost per horse in 1917. The cumulative cost per horse per month for the year is \$3.52 more than in 1916. A total yearly cost of \$42.24 per horse, or \$4,224 for every 100 horses owned. The wide variations between months are due to the fluctuations in the price of feed and amount fed per horse.

The increase in feed cost would have been very much larger but for the fact that the company maintained a hay warehouse, using for the purpose an abandoned icehouse located in the city. Hay (No. 2 upland) was bought direct from the farmers during September and October and stored in this warehouse. Early in July, 1917, the warehouse was burned and it was necessary to go into the market and buy hay. The lowest price paid was \$10.33 per ton and the highest \$17.70. The average price paid was \$11.72, or \$2.21 per ton higher than in 1916.

Another chart, Fig. 38, shows the average price paid for oats each month for a period of five years, with the average price for

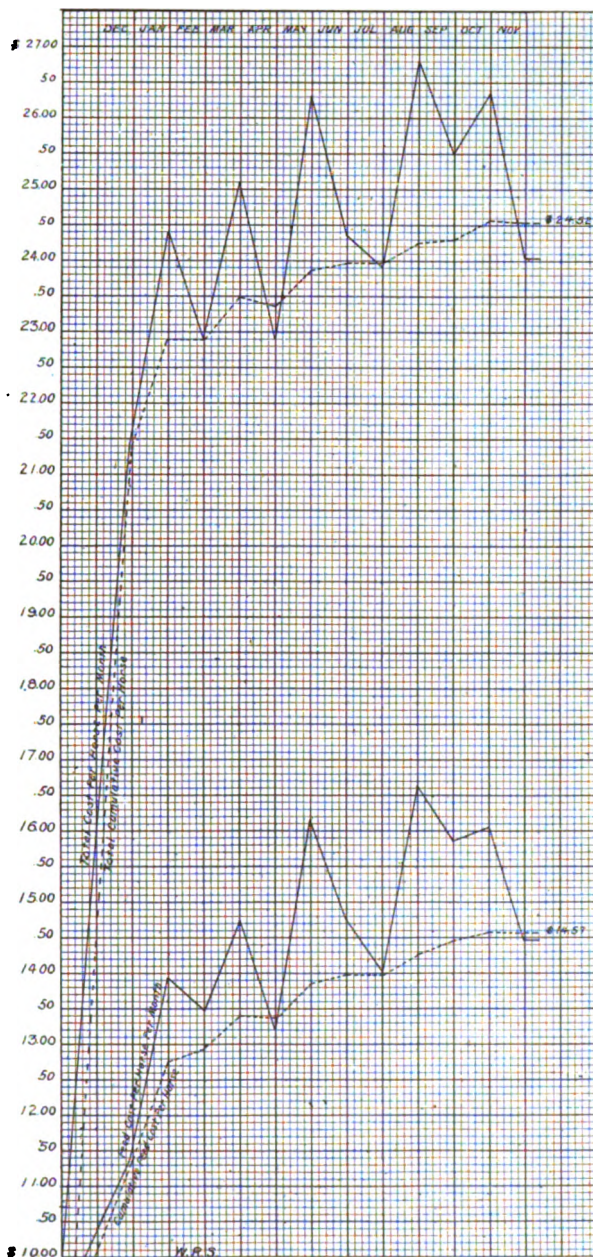


FIG. 36.—FEED COST PER HORSE PER MONTH; CUMULATIVE COST; TOTAL COST; TOTAL CUMULATIVE COST

each year. Notice how the price advanced in 1917. In the five years the price of oats advanced 73 per cent.

Barnmen, as a rule, are not very intelligent and have very little knowledge of figures. By presenting figures in chart form they can readily see how their feed cost is increasing or decreasing. The company from which these figures were obtained maintain twelve barns, and from the barn report illustrated (Fig. 35) they make up a monthly record showing the average pounds of all feed fed per horse and the cost. This record has been the means of effecting big savings in feed cost, as the individual record makes it possible to know at what particular barn the expense is greater than it should be and action taken to reduce it to normal.

**The Ice Wagon.**—The ice wagon, in large measure, reflects the standing or the development of an ice business. What message does the general appearance of your wagons convey?

Does it speak of smartness, up-to-date enterprise, cleanliness, prosperity, desire to please? Or does it tell of indifference to public opinion, slovenliness, get-along-somehow carelessness?

Compare your wagons with those of your most successful competitor, or the biggest store in town. Does the comparison show you at a disadvantage? If it does, there is no excuse for it, because you can certainly afford a first-class, up-to-date delivery wagon. Indeed, you cannot afford anything else.

Your delivery wagons can really be made a very valuable means of advertising. They go through the streets every day. Make them reflect your business favorably and bring to you new business.

The ice wagon, and the wording upon it, is probably seen by more people every day than all the show windows in any line of merchandising in the town. The proprietors expend thousands of dollars in making these show windows attractive. Why not spend a little in making the ice wagon attractive?

Attractive ice wagons, that appeal to the sense of beauty as well as fitness, so that people, especially the ladies, are led to remark about them, offer just as great an incentive to buy as does an attractive and beautiful show window for a store.

And this applies equally to motor trucks used in the ice

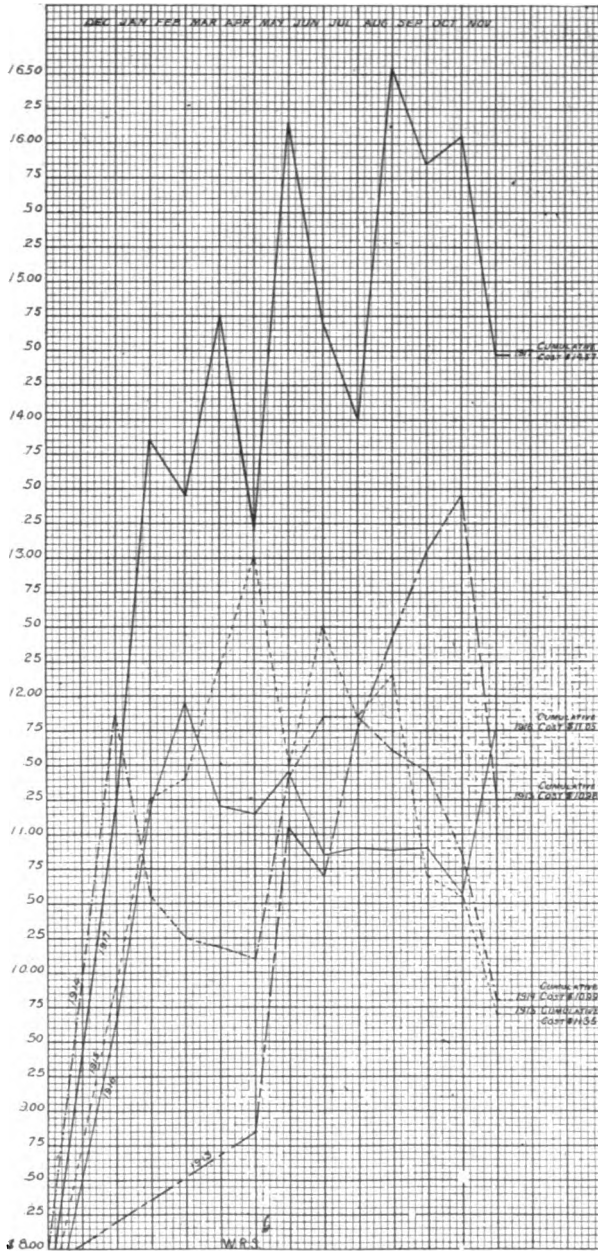


FIG. 37.—FEED COST PER HORSE PER MONTH FOR FIVE YEARS—  
1913 TO 1917



business. A little extra money paid for fine, first-class wagons and handsome trucks is the cheapest advertising available and makes the ice wagon a producer of business instead of an expense.

The appearance of the horses and harness is also an item of importance from an advertising standpoint. A wagon may be a perfect product of the wagon builder's efforts and resplendent in paint and varnish, and yet if the horse or horses that are attached to it are poor in appearance, dirty, with harness patched or held together with hay wire, the whole effect is destroyed.



ILLUSTRATION OF GOOD TYPE OF WAGON

Where two-horse wagons are used the horses should be as nearly mated as possible in size, color and gait, heavy enough for the wagon and load they have to draw, well groomed and in good condition. The harness should be well fitted to the horses and just showy enough to give them a dressed appearance. It should be kept clean and the metal parts polished.

With single wagons care should be exercised in selecting horses for them in regard to size. A small horse in a large wagon will cause ridicule. A very large horse appears out of proportion and is a poor investment, as big horses are usually heavy eaters and do not stand up well in ice delivery work because of their excessive weight.

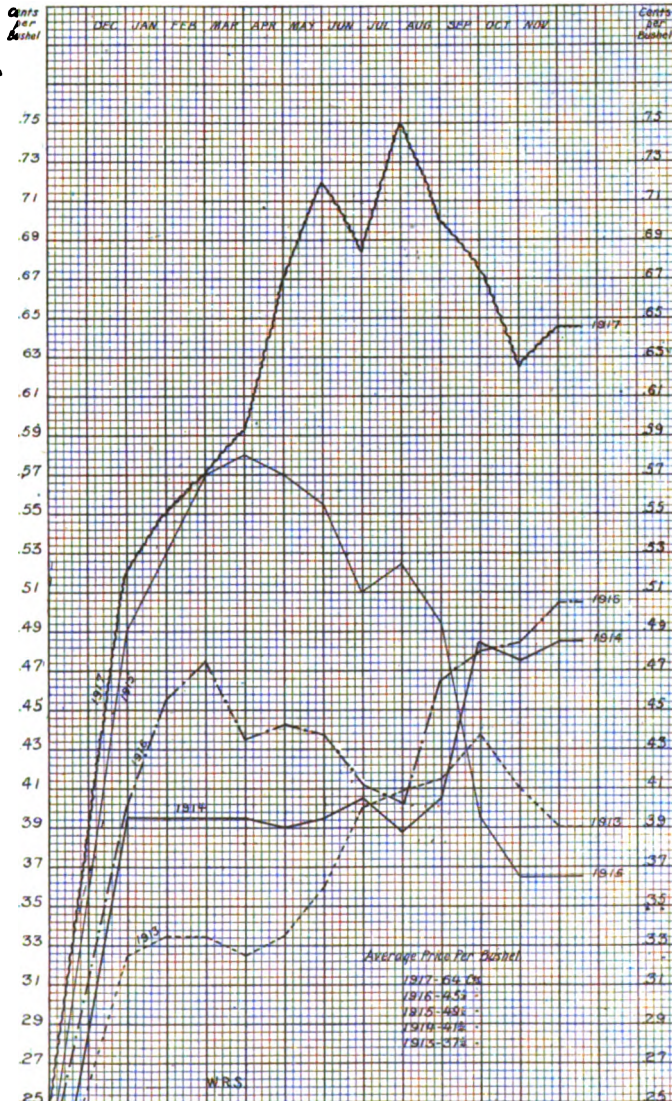


FIG. 38.—PRICE OF OATS PER BUSHEL FOR FIVE YEARS—1913-1917

**Material and Workmanship.**—In the building of an ice wagon two factors are employed—i. e., material and workmanship. One is dependent upon the other for the successful building of a first-class vehicle. The best of workmanship would simply be wasted were it applied in a case where the material used was of inferior quality. The same principle applies where the material is of the best and the workmanship poor.



TYPE OF WAGON USED IN PHILADELPHIA, PA.

The material used in an ice wagon is entirely lumber and iron or steel. Of the two there is no question but that lumber is very much the more important. The woodwork material of a wagon should be tough, perfectly dry and well seasoned. It is a difficult matter to purchase this character of lumber, unless it be "kilm" dried. To insure himself the proper material, every wagon maker should have the room to carry a stock of lumber for a length of time sufficient to allow the same to become thoroughly air dried.

Air dried lumber leaves the life in the timber, where the kiln

dried takes out all the vigor, thereby lessening the life of the same, which is a serious consideration, especially when the greater part of the woodwork in an ice wagon is constantly subjected to the air and water, thereby bringing on decay and rot. Anyone at all familiar with the life of an ice wagon knows that in all cases it is the decay of the timber, and not the wear and tear, as is the case in other vehicles, that makes it useless.

For the sills of an ice wagon oak should be used. It has longer life than hickory and for that reason is better. For the



ATTRACTIVE, DURABLE TYPE OF SUPPLY WAGON

standards, use hickory; it is tougher and stiffer, and is the best material for this purpose. For the panels use either yellow poplar or ash. For the hounds use second-growth hickory.

Regarding the iron material used in a wagon, the presumption is that iron is iron, and that's all there is to it. Of course, this is true where only common iron is used, and then a great deal depends on how it is used.

Using the iron as it comes from the mill or store will not disclose or bring to light the flaws in the same, and these same flaws are the very important question about iron. Very often,

no doubt, the excuse is offered for a breakage, that there was a flaw in the iron. Where a wagon carries the loads that an ice wagon does, all iron material should be well forged. The hammering and forging on the same will result in all the flaws being worked out, and they can not be overcome in any other way. Good mechanics are necessary for this work.

A great part of the wagon work of today is done in merely assembling parts and bolting them together; all parts are bought and the iron parts are usually malleable, which has not the resisting power necessary in an ice wagon.

**Construction.**—There are a number of points that are very important in the building of a wagon.

First—All woodwork must be well fitted and framed and put together with white lead.

Second—All forgings should be wrought iron and custom made, and to do this properly must be done by thorough mechanics.

Third—Use a soft steel for the tire, and see that tires are bolted. This will save your woodwork on the wheel if your tires get loose and give time to get to the shop to have them reset.

Fourth—Axles should be solid collar with chilled boxes.

Fifth—Springs should be oil tempered and the leaves should be a trifle heavier than used in any other wagon in order to allow for rusting which is caused by the ice water dripping, making the springs one of the short-lived features of a wagon.

Sixth—Clips and Shackle Bolts—The principal thing in this feature of an ice wagon is the material used, especially where iron and iron are clipped together. This must be of the very highest grade of Norway iron, so that it will stand the strain which is occasioned by the wagon pounding over the streets. You cannot fasten any clip so it will stay by only drawing up the nut on the thread of the clip, and the clip must be hammered to the point or bed where it is clipped from. Nothing but Norway iron will stand for this way of putting on a clip—in order to get the proper results.

The clips should fit perfectly and the holes in the clipbar should have the exact diameter of the clip. The stem that extends over the nut should be cut off and thoroughly riveted.

A very important feature about a wagon is the matter of the bolt holes in both wood and iron. Wherever these are necessary they should be the exact size of the bolt. This will prevent any unusual wear and add very materially to the life of the wagon.

**Painting.**—In the painting of a wagon the principal thing to be considered is the kind of material that is best to use. If the first coat is not the real thing, all the labor and other material is thrown away. This coat must be of pure lead and oil. It is necessary that this coat be worked into the grain of the material, as the first coat, in nearly all cases, stays until the death of the wagon, unless the owner has the first coat burned off in repainting, otherwise the first coat generally stays.

**Care of Wagons.**—Many companies have well-built, sturdy wagons, but decrease their life, and lose the advantages of their advertising value by having them poorly painted and lettered. Others will purchase good wagons, well painted and lettered, and then allow them to go to rack and ruin for the want of washing and greasing.

Companies that take pride in the appearance of their wagons provide a wash rack, and have the wagons washed and greased at regular intervals, and foremen or superintendents are held accountable for that work being done.

Many such companies follow a rule of having all wagons varnished each year, and completely repainted and lettered every two years. In this manner they not only lengthen the life of the wagons, but they always present an attractive and pleasing appearance.

**Company Shop.**—Many companies maintain their own shops, in which all repairs to wagons, harness and tools are made and shoeing of horses is done. Some companies build their own wagons, paint them and make their own harness. One company has standardized all of its wagon parts, and keeps a supply of such parts on hand, so that when any part breaks down it is replaced with very little loss of time. For large companies, a shop is probably an interest-paying investment. With small companies, it is very likely an expense. But when everything is taken into consideration, especially the big decrease in the loss of the service of wagons by being able to immediately repair or

replace broken parts, the replacing and renewing of shoes, and other features, the question of whether it can be done as cheaply as it could be done in an outside shop should not be considered too strongly.

But whether or not a wagon shop should be maintained, it undoubtedly pays any company owning 100 or more horses to have its own horseshoer. More horses are ruined by improper shoeing than by any other cause. The better service and longer life of a horse, when properly shod, will more than offset any additional expense incurred in doing your own horseshoeing.

A company owning between 275 and 300 horses employs two horseshoers and the cumulative shoeing cost per horse per month was \$1.19. These men practically know the size and peculiarities of every horse they shoe, therefore, when not engaged in shoeing they are making up shoes for the various horses, and remaking old shoes. This last feature is an economical one. As it is the calks that wear out it does not require much time to put on new ones.

**Tools and Wagon Equipment.**—Tools are an important feature in the equipment of an efficient delivery man. Some men are very particular as to the care and condition of their tools. Many are very careless. The foreman should see that each of his drivers has sufficient tools for himself and helper and that they are in good condition at all times. Tongs, the points of which have become dulled, are accountable for many painful accidents. It is impossible to make a clear straight cut with a dull axe. Picks are very serviceable both in splitting ice and in fitting ice in boxes. Shavers are a tool that should be done away with as part of the wagon equipment. Aprons are very good; they protect the driver and make the service more cleanly, as they eliminate the dripping from the ice while it is being delivered.

Unless tools are charged to the drivers they are very apt to be indifferent as to whether they lose them or not. Many companies charge all equipment furnished the driver and hold him responsible for their return at expiration of his employment. Where this is done, a record is kept of all tools furnished, and the cost of any tools which he fails to return are deducted from his pay.

# DELIVERY EQUIPMENT

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Station _____ Route No. _____ No. _____				Name _____ No. _____	
Name _____				Address _____	
No.	ARTICLE	Tool No.	DATE	Station Occupation Route No.	
	Tongs		Recd Ret'd		
	Axe				
	Pick & Sheath				
	Saw				
	Scale				
	Shaver				
	Pouch & Chain				
	Apron				
	Feed Bags				
	Water Pail				
	Blankets				
				Signed _____	

*I hereby acknowledge receiving all of the Equipment on this receipt which I agree to return at expiration of my term of employment.*

*Failing to return any of the Equipment listed I hereby authorize the Hygienic Ice Company to deduct from any money due me from said company the value of such equipment not returned by me.*

FIG. 39.—EQUIPMENT RECORD



Where tools are charged to drivers, it frequently happens that when tools are lost drivers will substitute others. All tools, therefore, should be numbered, which will protect other employees, and prevent substitution of inferior tools.

Where tools are charged, and a record kept of same, the driver should sign for the tools received. The form illustrated in Fig. 39 is a good one for that purpose. It could be made up

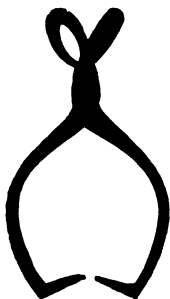


FIG. 40

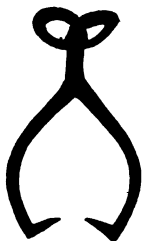


FIG. 41



FIG. 42

in book form or a card, preferably a book. With such a form it is easy for the employee to sign, and, being perforated, the receipt which he signed could be returned to him when he returns the tools. The tool record will be of much value to the station superintendent when taking an inventory of his tools. This form could be used as a general form for all tools by having the lines blank and writing in the articles furnished the employee.

The type of tools used varies in different parts of the country, and the preference shown by users is largely due to the style of tongs, ax or saw that one has become accustomed to by reason of the fact that it is the style in use in that particular locality.

Relative to tongs, the type known as "Boston Tongs" (Fig. 40) is probably more generally used than any other. The advantages of this type of tongs is that it is possible to catch the ice low on the sides, and by reason of the short shanks the weight is brought close to the hand, thereby enabling the user to handle the piece of ice more efficiently, consequently this type is gradually superseding other patterns.

Manhattan tongs (Fig. 41) are a modified pattern of the Boston. Outside of Philadelphia and its immediate vicinity, the

Philadelphia type (Fig. 42) is used but little. Other types are shown in Fig. 43.

Chain tongs are preferred by a great many ice handlers. Two styles of this type of tongs are shown in Fig. 44.

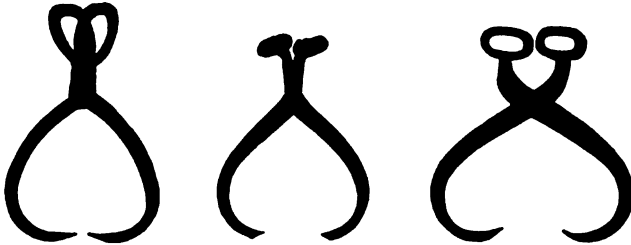


FIG. 43.—TYPES OF TONGS USED IN MILWAUKEE, PROVIDENCE, BUFFALO

The bows of tongs should not be notched for purposes of identification, as it weakens them. The span is measured when they are open as wide as possible, no allowance being made for the hands.

The use of axes and saws for cutting ice into the required sizes is being gradually eliminated, and the use of the pick for

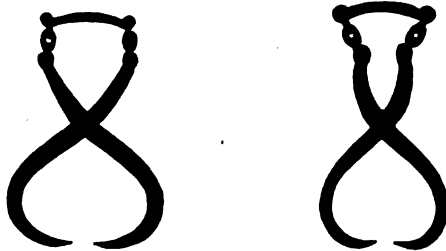


FIG. 44.—TYPES OF KANSAS CITY AND CINCINNATI CHAIN TONGS

the purpose more generally adopted. However, saws and axes are still used, particularly in the south and sections where natural ice is sold. Illustrations of several styles of each are shown in Figs. 45, 46, 47 and 48.

Owing to the general agitation regarding the weight of ice, every wagon should be equipped with a scale of good make, capable of standing the work and abuse usually given them. All scales should be accurately tested before issued to drivers

and should be inspected and tested once a month, at least. Illustrations of the scales in general use are shown in Fig. 49.

The use of the "pick" for splitting ice is becoming more general each year. Undoubtedly it is the quickest method of splitting ice, and while its use will not produce as clean and straight cut edge as when done with a saw, in the hands of an experienced user it will produce a cut much better than can be made by the average delivery man with an axe.



FIG. 45.—PHILADELPHIA HOOK AND SQUARE HEAD AXES



FIG. 46.—TYPES OF NEW YORK AND SOUTHERN AXES

The "pick" is very useful at times in placing ice into receptacles, and while its use for such purposes should be avoided as much as possible, there are occasions when its use is necessary. Several styles of this tool, and the sheath in which they should always be carried, are shown in Fig. 51.

Another feature of equipment for delivery men, which is growing in popularity and use, is the "Ice Apron." It is a great protection to the man, and by its use the good graces of the housewife are secured, for it prevents the drippings from the ice reaching the floor.

The straight-top style of pocket ice apron (Fig. 52) has been in use for many years. This apron is cut straight across the top and is held in proper position by a light harness.

The cut-out style of pocket apron (Fig. 53) is cut high in

the neck and extends over the shoulders. This style is much preferred by some, especially by those who carry ice higher up on the shoulders, as it affords more protection than the old style. Both designs are very popular.

Pocket ice aprons are made for those who carry ice on the back. When delivery men get accustomed to this method they never return to the "lugging" plan.

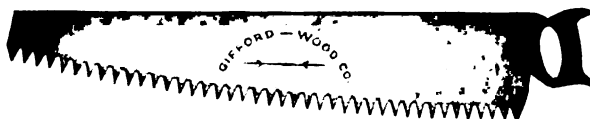


FIG. 47.—HAND ICE SAW, GUARD IRON HANDLE



FIG. 48.—HAND ICE SAW, OVAL IRON HANDLE

When drivers are allowed to sell coupon books they should be provided with a pouch of some kind in which to carry the coupon books. The City Delivery Co., Little Rock, Ark., provides each driver with a pouch made of thick leather of a size that will hold as many books as it is deemed necessary for the driver to carry, with a flap which covers the top and is clasped with a buckle similar to the ones used on galoshes. This pouch is carried on a belt run through a strap on the back of the pouch. In this manner the books are kept clean and dry and the style of clasp used on flap keeps it securely fastened, and yet it is easy for the driver to open and close the flap.

**Uniforms for Delivery Men.**—This subject has been given a great deal of consideration by manufacturers and dealers who maintain a delivery service, also at various conventions of ice men, and many companies now are adopting a regular uniform for the men.

Delivery men usually are very independent and many object to wearing uniforms. If the proposition is handled with tact and judgment, the objection of the men can be overcome. Most people object to having anything for which they have expressed

a dislike forced upon them, also many men object to wearing a uniform of any character, but the method used by the General Ice Delivery Co., Detroit, Mich., surely could not meet with that objection. While the statement is made that the object of the company is to have all of the wagon employees uniformed, it does not say they must do so, but suggests it is best for the employee's interest as well as the company's, that they should wear the regular uniform.

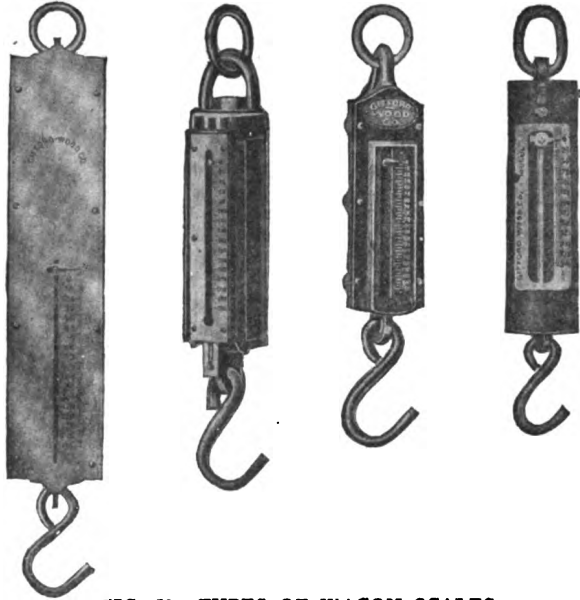


FIG. 50.—TYPES OF WAGON SCALES

The manner in which this was presented to the men was by the publication of the following article in the company's house organ, "The Abso-doer."

#### HAVE YOU YOURS YET?

Within the last week or so we have noticed that a good many of the men are wearing neat blue outfits while on the wagons. This is particularly pleasing, inasmuch as we are endeavoring to make this popular throughout the organization.

We have always dwelt on cleanliness among our men. The word "Absopure" is synonymous with cleanliness. A neat outfit such as some are wearing is not only clean in appearance, but is economical for you to wear.

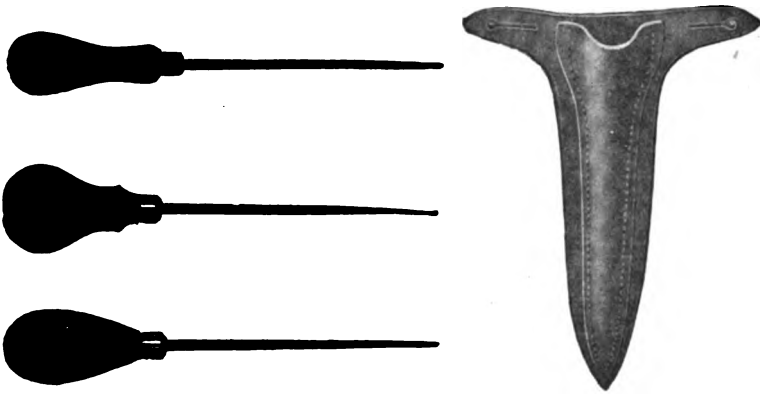
The outfit we refer to is navy blue in color, of cool cloth and is very inexpensive. The cap is also blue and of light material.

The men using them at present bought them of their accord, because they realized their value. We suggest that every man on a wagon get one of the outfits at an early date. If you don't happen to know just what we expect of you along this line, consult your superintendent, who will assist you in procuring one.

I wish to personally commend the men who have started the ball rolling, and hope to see every man fall in line very soon.

FRED J. ARMSTRONG,  
General Manager.

Cleanliness and its relation to ice selling is a hobby of S. P. Harris, Springfield, and in order to have clean working delivery



FIGS. 51.—ICE PICKS AND SHEATH

men he says he started in the first year and uniformed the men. He furnished the uniforms and the men were to take care of the laundering. They were to wear two uniforms a week. These were of brown khaki. The next year the same sort of uniform was used. The wagons were painted white so the next year the men were supplied with white uniforms. They get a clean one every morning. That is, when the wagon was ready and hitched up, they went to the locker room and put on a clean white sterilized uniform every morning and the people liked it. He had  $33\frac{1}{3}\%$  more private customers on the books at the end of the year than he had in the spring. As to the cost of such an extreme in cleanliness, Mr. Harris said they had thirty-two drivers and the total cost per man per uniform per season was \$8.60. Two

colored women were hired to wash the uniforms for \$12.00 a week and he furnished soap and coal to do the boiling and drying. The soap bill was \$47.00 for the year; everything considered, the cost was about \$14.00 per man for the season lasting from the early part of May until October. He said when those men and wagons went down the street people would turn around and watch them.



FIG. 52



FIG. 53

He experienced no trouble in securing uniforms readily. He bought them from a clothing store in town who were very willing to keep them on hand or secure them on short notice. The suits were made of plain white duck or drill, and every man was measured for his uniform, as an ill-fitting uniform detracts from the appearance of the man. These uniforms were only worn during the heated period.

A man who is cleanly dressed usually will do everything in a cleanly way, while if he is dirty and unkempt he is more apt to be more or less careless in what he does.

The City Delivery Company, Little Rock, Ark., uniformed

its entire force of delivery men, including foremen, drivers, helpers and truck men. They are much gratified with the success which attended their efforts, and state that the men are also pleased with the arrangement, as they realize that the uniforms

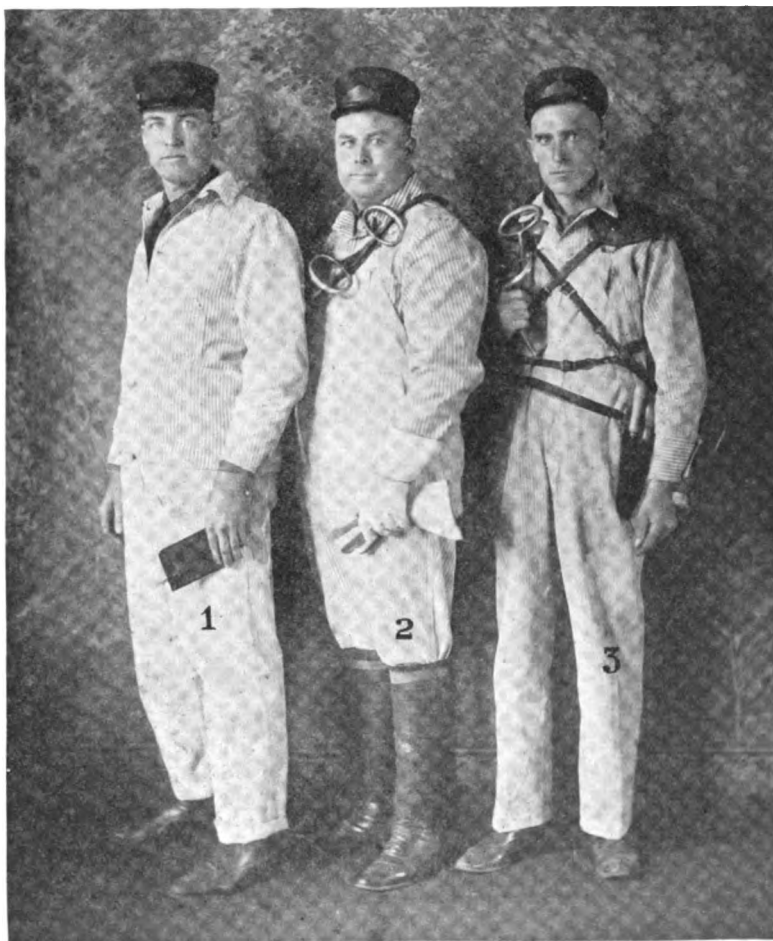


FIG. 54.—UNIFORMED DELIVERY MEN

are not only much more practical to work in but save their own clothing, and under the arrangement with the company, their working clothes cost them about one-half the price of what they would have to pay for them otherwise.



The illustration, Fig. 54, gives a very good idea of the appearance of the men in uniform. From left to right in the picture is represented foreman, truck man and driver. The driver is shown with his apron and sheath for carrying his ice picks.

The material from which the uniforms are made is what is known as express stripe, which is a blue and white goods used in making overalls and jumpers. The cap adopted is the same as used by railway men and motormen. A metal badge is worn on



FIG. 55.—TYPE OF EQUIPMENT USED IN CENTRAL DISTRICT  
the cap with the words, "City Delivery Company," in a half circle and the word "Ice" below, with the number of the delivery man at the top of the badge. The inscription is in black letters.

Foremen wear the same uniform as the wagon and truck men, with the exception that the word "Foreman" appears upon the cap, and they are supplied with a badge which is worn upon the coat.

Three changes of uniform are required each week and six suits are necessary for each man. The delivery men are penalized \$1.00 for each offense for failure to wear the complete uniform. This sum is taken out of their weekly pay envelope and a slip placed therein, stating the time and place where the delivery man

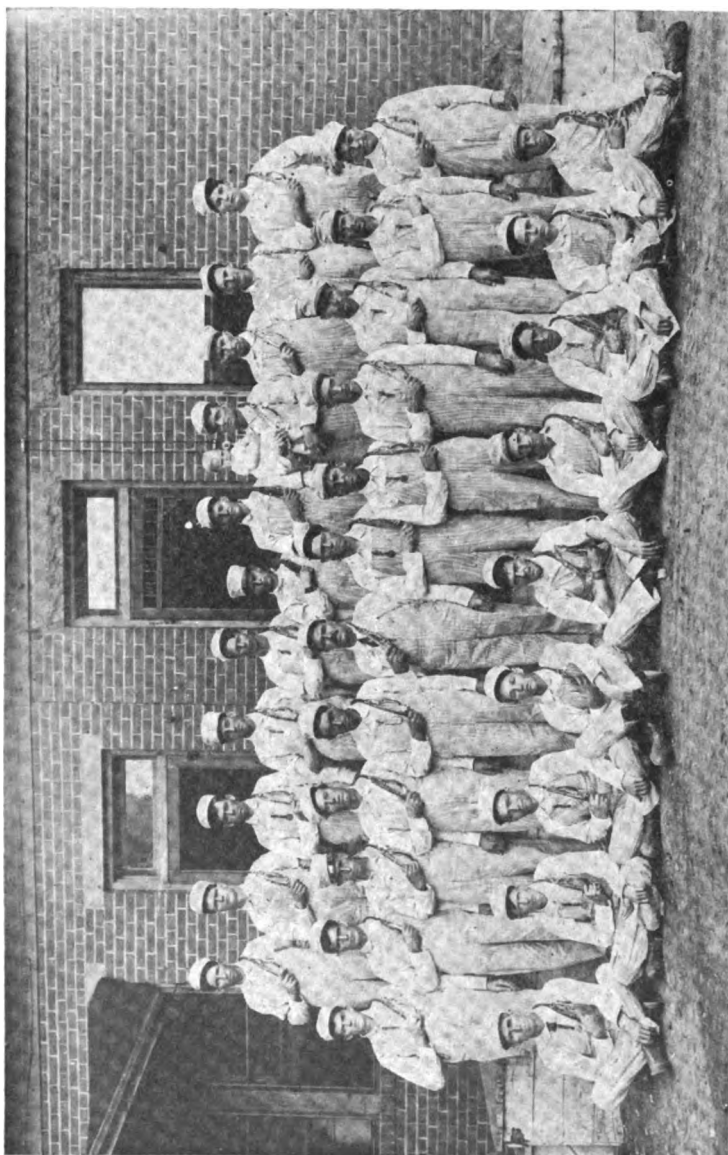


FIG. 56.—GROUP OF UNIFORMED DELIVERY MEN

failed to comply with the regulation concerning the wearing of the uniform.

The company secured a greatly reduced rate from a local clothier for the equipment and pays fifty per cent of the price of the uniform and cap, upon a signed receipt showing its purchase by the employee.

In Fig. 55 is shown one of the wagons used in the central district for delivering ice to commercial trade, which has been found to be the best type of wagon for that purpose.

It can readily be seen that such type of equipment, with employees uniformed as shown, has a high advertising value, and tends to increase respect for the company.

One of the best and most serviceable uniforms for deliverymen was that which the old Knickerbocker Ice Co. of Philadelphia supplied to its men at cost. It consisted of navy blue flannel double-breasted shirt and navy blue flannel trousers. Both shirt and trousers were specially made for the company and gave long and satisfactory service to the men. A particularly good feature about flannel is that it absorbs perspiration and no matter how wet a man may become, it is seldom he ever gets a cold. Another point about the color was that it did not fade and always looked clean.

Men have to have clothes to work in and in the case of the uniform shirt and trousers furnished by the Knickerbocker Co., they could not get anything that would give one-half the wear. Each man was furnished with two shirts and one pair of trousers and he paid for them out of his first week's pay or he could pay for them in installments.

**Well Dressed Drivers.**—Neatness of apparel adds many points in securing the favorable verdict of the public. Good clothes do not make the man, any more than they do the woman, but they help a lot. This fact is appreciated by an ice manufacturing concern in Oklahoma City, whose white clad ice drivers make an attractive appearance, as may be noted from the accompanying reproduction of a photograph of "the boys" in their work-day suits (Fig. 56). During the summer months the drivers are required to purchase two uniforms of the kind shown in the illustration, and are required to change the uniforms twice each week. Incidentally it promotes personal pride and courtesy.

## CHAPTER X.

### USE OF MOTOR TRUCKS IN ICE DELIVERY.

**Factors to Be Considered.**—The question, "Do motor trucks for ice delivery service pay?" has been asked many times, alike by owners of motor trucks, as well as by those considering their use in connection with their present delivery equipment. Answers, both negative and affirmative, have been given to this all-important question, and in nearly every case, represent the result of the individual experiences with motor trucks in ice delivery service.

Regardless of what has been said and written on this subject, the fact remains that the use of trucks for the delivery of ice is constantly increasing.

Many things are to be considered in connection with the use of motor trucks. Service is the principal one. Men who claim trucks are not as economical as horse-drawn vehicles state they find them an absolute necessity because of the service. Another advantage is their greater speed during abnormal weather; they can be crowded on a very hot day when it would be destructive to horseflesh.

The driver of the truck is another important factor in economical operation. Some men will show economies in running of as high as fifty per cent. Certain men take infinite pains with their truck, seeing that it is kept clean, well oiled, all grease cups full, while others watch the clock and are away before the engine comes to a full stop.

Many employers say the best truck chauffeur is one who

has never driven a pleasure car, but who has held the lines over teams of horses and can steer a wagon in traffic.

For wholesale delivery, long hauls, supplying of route wagons, and special delivery, it is generally acknowledged that the gasoline truck is economical when kept in continuous operation. As to the use of trucks for regular route delivery, that is a subject that is receiving a great deal of consideration. Some few companies are using gasoline trucks for this purpose and others are using the electric truck.

The ice dealer who is thinking of buying a motor truck must consider the question from three phases of delivery, wholesale, route wagon supply and regular trade. Will the truck pay in all three classes?

There appears to be a lack of authoritative information available on some of the different points of this subject. Possibly this is due to the peculiarities of the different classes of hauling in the ice business, or perhaps some who have tried them have not found motor trucks economical. More information seems to come from the truck dealers' point of view than from the ice dealers'.

The manufacturer of motor trucks often asks the ice dealer who is using one, how much he has been able to accomplish with it? The ice dealer wishing to send in the best showing possible, reports what he has been able to do hauling to branch or storage houses and large consumers. He can make a much better comparison from this class of hauling than from delivery to route wagons or regular trade. For these reasons one seldom hears or sees a report on the last mentioned classes of hauling.

Another thing to be considered is the decrease in the amount of shrinkage on route wagons supplied by motor trucks compared with the decrease when supplied by teams. All know what a long, heavy pull means to the supply team on a hot day. The hotter it gets the more necessity for speed, and the slower the driver must go because of the team. The drivers all calling for ice and when they come in tell of the holes and toothpicks received from the supply wagon to justify their shortage. With the truck it is different. The hotter the weather is the better it works. It never gets tired. The ice is out of the house a much shorter time and arrives at the wagons

with the frost still on. Some of the wagons may be loaded lighter in the mornings and supplied later with fresh ice. This gives a much better check on the driver and puts it up to him to make proper returns.

It has been found that a 3-ton gasoline truck under normal conditions will replace 2.9 teams on the route wagons supply. By starting it an hour earlier in the morning and adding some wholesale deliveries, one company has been able to increase its efficiency by nearly one team and at a saving of 18½¢ per ton.

In the matter of wholesale deliveries this company has done by ten o'clock with a 3-ton truck the work it formerly took one team all day to accomplish. The manager, Gale T. Laurence, said it was hard to give a reasonable comparison of expense for deliveries of this class made in the afternoons, when the family routes are run in the mornings, because there are so many things to be taken into consideration for which you cannot arrive at a concrete basis of saving in expense. If there is a number of customers to be taken care of and some cars to be iced you will naturally send the truck on the long hauls to the outskirts and your teams to the ones close in or to the cars, thereby cutting down the tonnage for the truck and increasing its delivery expense per ton. You will, however, be able to utilize your extra men to a much better advantage on the cars and also rest up those teams which come in jaded and tired from the morning routes. It is an impossibility in this case for the teams replaced on a tonnage basis to cover the mileage demanded of a truck on a hot day.

Then again if you send the teams in place of the truck, the men seeing that they would be late getting in would drive harder and the team would suffer. If you had sent the truck to the cars it would probably have stood there while the cars were being iced, lessening your mileage and thereby defeating the purpose for which you bought it. On the other hand, if a conveyor for elevating the ice to the bunkers could be attached to the machinery of the truck a great saving of labor could be effected.

In order to secure first-hand information regarding the experience of ice manufacturers and dealers in the use of motor trucks for ice delivery, ICE AND REFRIGERATION, through its Bureau of Investigation and Service, conducted an investigation

on the subject during which over 3,000 letters of inquiry were sent to ice manufacturers and dealers, with request to fill out and return blanks, containing, among others, the following queries:

- Number, make and capacity of trucks in operation?
- Average daily tonnage, June to October?
- Average daily mileage, June to October?
- Other purposes of truck than ice delivery?
- Are you considering purchase of motor trucks?
- What capacity truck is best suited to your business?
- What make truck do you prefer?
- What local conditions react against use of truck?
- Would you consider light cars for special delivery?

More than 1,000 replies were received and among these more than 200 who gave particulars regarding their experience with motor trucks for ice delivery. Many others gave partial or incomplete replies. More than 100 replied that while they had at present no trucks, they intended to purchase motor vehicles soon. Nearly 100 reported having recently purchased trucks and hence could not yet give figures on operating cost, etc.

As replies were obtained as confidential reports, no publicity can be given as to names or locations, and only a general analysis of the results is given.

The reports developed that motor trucks are being used by ice dealers for the following purposes:

1. For wholesale deliveries to large consumers.
2. To supply their route wagons, thus eliminating the necessity of each route wagon returning to the plant for a new supply. This keeps the route wagons working steadily with no loss of time in returning to the plant for more product.
3. For special delivery service, to serve emergency calls and for making deliveries to customers who have not been served by the regular route wagons.
4. To extend the delivery service to outlying and suburban districts far removed from the plant. With the motor truck, ice dealers are able to cover a greater territory, greatly increasing the number of customers and the output of their product.
5. To supply neighboring towns in which no ice plant is located. These towns have heretofore been served either by freight or express deliveries, with a great loss of product and at high expense for hauling.
6. To make deliveries to the rural districts, thereby creating

regular customers of the farmers who heretofore had been irregular users of ice, as they only secured ice when they were in town and called at the plant for it.

7. To deliver coal and other products in winter and to haul goods of various kinds when machine is not required for hauling ice.

8. In some instances, to do all the ice delivery, wholesale and retail, to residences in town and to country customers, using no horses whatever.

Contrary to the general belief that only large capacity trucks are used for ice hauling, investigation proves that all makes and capacities of trucks are suitable for ice delivery service. The small capacity trucks are used for special delivery service and for supplying consumers such as ice cream stores, butcher shops, drug stores, saloons, and others who use daily from 200 to possibly 1,000 pounds of ice. It has been found that with the smaller capacity truck the ice dealer is able to make his deliveries more quickly, thereby reducing shrinkage and at the same time the smaller truck is able to get back to the plant much more quickly than those of larger capacity. Many ice dealers have found that it is more economical to use two trucks of smaller capacity and with increased speed than one truck of even greater capacity than the two small, and that the use of truck enables them to give better service.

Thus, an ice dealer who now uses a 5-ton truck and seven single wagons, reports that the present service is 90 per cent better than it was before, when he used four 2-horse wagons, two men to the wagon. The cost, he added, is about the same. But he found that about 70 per cent of the time his truck was too large and 30 per cent of the time it was too small. The opinion was expressed that two 2-ton trucks would give better satisfaction than the one 5-ton truck. The town is not hilly but homes are rather widely scattered.

An ice dealer in New Jersey who has used motor trucks for two or three years, and has a hilly territory, reports finding that during hot spells the motor cars can be rushed right along and continued in operation the entire twenty-four hours of the day, if necessary, while the horses have to take it very slow. Each of their  $1\frac{1}{2}$ -ton trucks, it is added, takes the place of two teams and at times has done the work of five horses.

Over eighty per cent of the reports received indicate that



the motor trucks purchased were used to serve delivery wagons, to deliver to ice cream factories and other large users and to deliver to trains for shipment.

Approximately thirty per cent of those replying use the trucks also for delivery of other goods, such as hay, grain, lumber and other commodities in summer and for coal deliveries in winter.

The conditions of ice delivery with motor trucks vary so widely and the method of arriving at actual costs are so imperfectly understood as yet, that no attempt was made to obtain the cost of delivery per ton of ice, but quite a number of the replies contained more or less complete statements of cost.

Comparison of costs are valuable only when the local conditions as to kind of roads, length of haul, frequency of stops, etc., are all known and considered, as well as the several elements of cost.

Of more practical interest are figures concerning the tonnage and mileage and gasoline consumption, and the saving effected by the number of wagons and teams replaced by the truck and doing the same work quicker and better.

Regarding the displacing of teams, it is shown in the reports that in one case one 2-ton truck replaced two wagons; in another, that one 3-ton and one 2-ton truck replaced five wagons, and in still another, that three 1½-ton trucks had displaced six wagons. These represent the extremes. A prominent ice manufacturer states: "Our motor truck used as supply wagon will save us \$500 a year."

With reference to tonnage and mileage the variation is considerable, the following being typical figures from the reports:

#### AVERAGE TONNAGE AND MILEAGE

Av. Daily Tonnage.	Capacity of Truck.	Av. Daily Mileage.
35 in summer	4 -ton	40 in summer
12 "	2½-ton	20 in winter
30 "	3 -ton	40 in summer
20 "	2½-ton	45 "
4 "	¾-ton	75 "
12 "	2 -ton	40 "
11 for season	2 -ton	40 "
3 in summer	1½-ton	10 for season
25 "	2½-ton	25 in summer
15-30 "	3 -ton	50 "
30 "	5 -ton	20-50 "
		12 "

The above represent a fair average of the tonnage and mileage reports from about 100 users of trucks of various sizes, used in city or town deliveries. A number report on the quantity delivered to route wagons in forenoon and to wholesale trade thereafter, an Indiana dealer who supplies route wagons with thirty-six tons and wholesale dealers with fourteen tons by means of a 2-ton truck, as an average summer day's work, representing one of the high records.

The average mileage per gallon of gasoline is given as four miles for a 4-ton or 5-ton truck to eight miles for a 2-ton or



TRUCK SUPPLYING ROUTE WAGON

3-ton truck. Two reports, one from a level and one from a hilly town, both with a  $2\frac{1}{2}$ -ton truck, give six miles in the hilly town and six and one-half miles in the other.

An ice manufacturer having had experience with both teams and trucks states that "a motor truck constantly employed at or near full capacity is more economical than the same tonnage delivered by wagon. If not constantly employed the economy vanishes." This, however, did not take into account the improved service.

One ice dealer who gives figures regarding his first season's experience with motor trucks shows an apparently very marked saving over cost with teams, a saving that may possibly not be verified when the figures have been spread over two or more seasons. However, he adds by way of emphasizing his satisfaction from the use of a  $\frac{1}{2}$ -ton truck for quick deliveries: "The small truck is a customer satisfier. It sells enough extra ice to more than pay its way and a satisfied customer is a competition eliminator."

An ice dealer in a small town in the South remarks: "We are using a 1-ton truck which is proving very satisfactory. It is a great stimulus to business. We are getting business we never had before." This dealer explained that he used the truck to go into the country and secure customers among the prosperous farmers and fruit growers who had not previously purchased ice. This dealer also reports, as did a number of others, that he found delivery of ice by truck to near-by towns much cheaper than delivery by railroad.

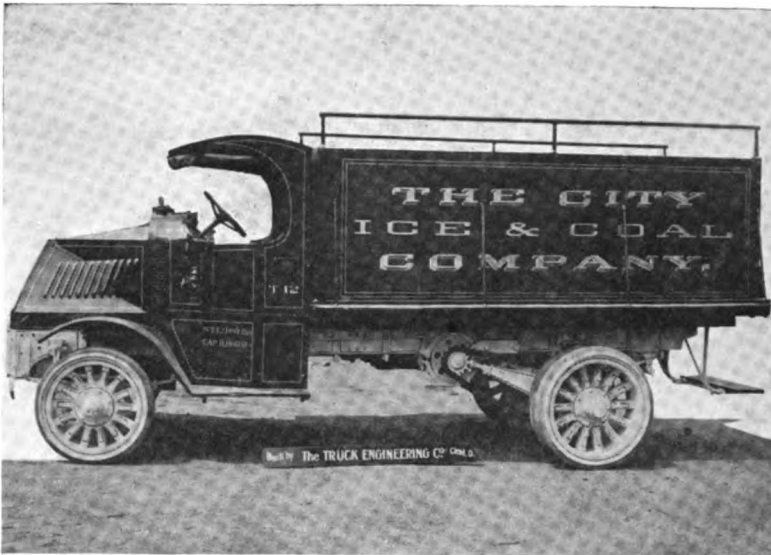
In a few places ice dealers are using motor trucks for retail, that is for house to house delivery. One prominent ice company in a western state reports that it is making all deliveries by motor trucks, having disposed of animal power altogether. Nine  $1\frac{1}{2}$ -ton auto trucks are used and five converted Fords. Two of the  $1\frac{1}{2}$ -ton trucks are used for wholesale deliveries and are always loaded to two tons per trip. These averaged seventeen miles per day.

The numerous replies received by ICE AND REFRIGERATION in answer to its questionnaire on motor trucks developed the interesting fact that no special make or type of truck is considered superior. About every make of truck in America is represented in the replies and both gasoline and electric trucks had their advocates. In any case the question as to the kind or type of truck is primarily a question of local conditions.

**Fitting Trucks to the Ice Business.**—A truck is not just a good, bad or indifferent truck. It is considered far more than that by progressive ice dealers and manufacturers throughout the country. In other words, they do not look upon their haulage equipment as just something to feed gas and oil, place in a driver's care and then forget about until they have it forcibly

brought to their attention through the medium of a stiff bill for repairs.

Motor trucks, horses, or anything else the ice dealer may use in the haulage of his ice and supplies are transportation, no more and no less. The firms that consider them as such are far more apt to show a profit in this item, which, as everyone knows, makes up a large percentage of the cost of ice, than the dealers with hit or miss methods of checking up on their haulage equipment.



GOOD TYPE OF BODY MOUNTED ON MACK CHASSIS

Without definite figures there is no sure way of knowing that the proper units are being employed. There have been instances where the rearrangement of a loading platform eliminated one truck by minimizing delays.

In other words, a transportation expert thoroughly familiar with haulage conditions and problems can, usually, after a survey of an ice dealer's business, make suggestions which should considerably reduce the cost of handling the ice.

The Packard Motor Car Company of Chicago briefly sum-

marizes the information for a transportation survey, as follows:

- Go over plant thoroughly.
- Observe loading and unloading facilities.
- Sources of supply.
- Methods of distribution.
- Horse and wagon cost.
- Truck cost.
- Opportunities for increased business.
- Conditions under which trucks must operate.
- Location, etc., etc.

With the answers to these questions at hand the transportation man can determine whether the ice dealer needs motor trucks or not. If he does, how many, what they will cost to operate, and just what capacities will be profitable. He also determines if horses can be done away with, and if not, just what work they must do, and how much of it, to show a maximum return.

A truck salesman was recently talking this matter of transportation over with a very progressive ice dealer. When the point in the conversation regarding truck capacity was reached this man said: "So far I agree with you. We will take it for granted I have called in the transportation expert and he has made his survey. He tells me what changes to make and that I must add a two-ton truck to my equipment. Now, just what is a two-ton truck? It's anything the manufacturer cares to make it," he continued, without waiting for a reply to his question. "The reason is, that up until a short time ago there was no definite method of rating truck capacity. The manufacturer who had his plant in a city of level streets and no hills, made a two-ton truck which would haul that amount of material over the smooth paved highways of the particular city in which his firm was located. The maker in a hilly town made a truck capable of handling loads in his territory. So far so good. But suppose an ice dealer in the hilly town bought a truck designed for work on smooth, level streets. It wouldn't be capable of hauling a two-ton load over the hills of his city without soon racking itself to pieces. Likewise, if a dealer in the city without hills bought a truck from the manufacturer in the other city he would be able to haul two tons, but have more truck capacity than he needed.

"It is just the same proposition as the railroads are confronted with every day. A locomotive pulling a train across the prairies of Illinois will deliver as much power to the draw bar as one pulling the same load through the passes of the Rockies, but the changed conditions make necessary the use of twice as much power to pull the same load over the mountain grades as was exerted in moving it over the level land. Or, if you want an example more directly connected with the ice dealer, here it is: One horse will pull as big a load of ice on a smooth con-



TYPE OF TRUCK USED BY CHICAGO COMPANY

crete highway as ten horses on a loose gravel one. I could go on and cite you a lot more facts," continued the dealer, "but these will suffice to illustrate my point, and in view of them I cannot figure out why in the world a truck manufacturer will sit in his factory and try to tell me the capacity of a truck I may put in service a thousand miles away. We'll presuppose that a truck is a good one. That the manufacturer has put into it the best that he can, that he controls its production practically right back to the raw material, and that it represents a quality product all the way through. Such a truck would be built to haul its rated load anywhere. That is under the worst imaginable con-

ditions and still have a little reserve power to prevent wasteful depreciation. We'll stick to the two-ton truck. Such a vehicle would be ideal for the ice dealer who was forced to haul two tons under the 'worst possible conditions.' But how about the man who had unusually good conditions? He'd be buying at least twice as much truck as he could use. In other words, a truck has to be fitted to its job. That is the big task of any real transportation engineer. Aside from all the other considerations entering into the haulage problem, he is solving one of the biggest items in the conditions under which the truck or trucks must operate."

The ice dealer is right. A truck of any capacity will not show a profit to the owner. It takes the particular truck of a size best suited to the work to put haulage figures in the right column.

There is nothing revolutionary about this putting a truck in its proper place. It is merely the same application of common sense which determines certain employees to be best suited for certain tasks. No matter how good a man or what his capabilities, if he is in the wrong niche his efficiency and consequent usefulness to a firm is much less than it ought to be. The same applies to trucks.

In view of this the natural question is why truck companies continue to sell trucks according to factory tonnage ratings. The answer is that the practice is rapidly becoming obsolete. Every day trucks are coming more and more to be sold for the job and not by the rating plate.

One big manufacturer has done away with ton rating entirely. Before an ice dealer buys a truck a transportation expert from the company goes over his hauling problem. It is upon his recommendations that the sale is made. The dealer may have told the truck salesman he wanted a number of trucks of certain sizes. The expert's survey may show that he needs a less number. If this is the case the recommendations of the engineer are made as unhesitatingly as in the case where additional equipment is necessary. Officials of the company have cited instances of where a dealer, convinced of the necessity of additional equipment, has been shown how by rearranging his facilities and routes he could eliminate the necessity. In other words, secure

the maximum efficiency from the equipment he already had and so forestall the outlay of any additional capital.

This is in line with what was said above. A truck is far more than just a good, bad or indifferent truck. It represents an investment in transportation. Properly fitted to the work it is to do, it should show a profit. The keeping of definite cost figures on its operation will show whether it does or not. But there are other considerations besides securing the right equipment.



PACKARD TRUCK WITH CANVAS COVER

**Points to Be Considered in Buying Trucks.**—Every ice man does not know how to select the right truck, both from an economic and service standpoint, and Burt R. Barr, in the following paragraphs, sets forth some of the important features which every purchaser should seek when buying a motor truck.

Almost any blacksmith, in a remarkably short time, could build a truck, to your direct specifications. From any one of several concerns he could buy a motor of proven worth. From another he could purchase a strong sturdy frame. He would have a wide selection of reliable, wear-resisting bearings. He could buy well-known axles, gears, wheels, springs, radiator and hundreds of parts that go into a completed truck. Every unit in



that truck would be as good as could be obtained. The truck would possibly be as good as could be built by experts who had to follow your instructions to the letter. The blacksmith would only assemble the various units. But would that truck be a good investment? Would it meet the thousand and one requirements of a good commercial car?

Probably not. It would lack one essential thing. It would lack the experienced designer, who by years of study and test has overcome the stumbling blocks that impede the way of the inexperienced.

Because each part is good, it does not necessarily follow that the whole is beyond improvement. Each stone in a mosaic may be perfect—but the mosaic itself will not be good if put together by an inexperienced artist. So it is with motor trucks. Each part may be the best that can be bought—but the completed truck may not give satisfaction. The only test of truck worth is performance. Performance inevitably reflects the ability of the designer—ability gained only through experience and constant determination to reach perfection. Bear this in mind when you come to select a truck that will give long, uninterrupted service—at a moderate initial outlay and reasonable operating and maintenance costs.

First of all, at any price, you will want a truck that is going to be a good investment. To be a good investment, it must operate at a profit. This means that its service must be uninterrupted. It must stay out of the shop. It must not be held up for roadside repairs. It must not be wasteful of tires and gasoline. It must have long life. But a truck might be all of these things and yet, if the first cost is excessive, prove a poor investment. Other things being equal, you would make a poor investment if you paid a high price for a truck having no advantages over one which could be bought at a material saving.

Bear that in mind when you finally decide.

You would likewise be using poor judgment to buy a truck from a dealer who was not progressive and prosperous. His very prosperity is, in a measure, a guarantee of the worth of the article he sells. Only a prosperous dealer can afford to carry an investment that assures him of a full line of spare parts. Only from such a dealer can you always be sure of efficient service.

Men of that type realize the importance of "service." Their interest in the truck you buy is not ended when they receive your check. They know that their future prosperity depends upon the satisfaction given their customers. It is to their interest to see that you receive continuous economical service from your truck.

Naturally, it is to your interest to deal with men of that type. Your business experience has taught you the futility and poor policy of attempting to deal with unprogressive, unprosperous men. They will "guarantee" almost anything you ask. But what is the value of their "guarantee," with nothing to back



#### COMBINATION STAKE AND SIDEBARDS ON WHITE CHASSIS

it up? They can't afford to keep a full line of parts. If you have an accident, it will take days, maybe weeks or months, for them to replace the damaged parts. If the truck fails to give satisfactory service, they are not in a position to make it good. A guarantee is never stronger than the man who gives it. These things have been learned in almost every business. Don't forget them when you buy a motor truck.

Don't buy a truck merely because it has an excellent motor, good axles, fine bearings. You may feel sure that you get them in any truck which, for more than a brief period, has proven

satisfactory. Buy rather on the basis of past history. Demand a truck that has come untarnished through the trying test of hard, continuous usage under all conditions. Buy a truck made by men whose past success may be taken as an indication of hopes for the future. Makers of that caliber can never afford to stake their reputation and their business hopes on a mediocre truck. They can never afford to sacrifice quality for immediate profits.

A truck may possibly be good even if built by a new concern, provided that concern has been wise in its choice of designers and engineers. But there is a risk that its designers are inexperienced or have failed to profit by their experience. When you buy a truck, your investment is too large to gamble with. You cannot afford to take a chance. It would be a poor article of unknown value.

Take, for instance, a seemingly unimportant detail like the location of a cross member on the frame. The frame—merely as a frame—may be the best that can be built. Unless that cross member is correctly placed in its relation to other parts, however, the frame will soon develop weaknesses. Shorten or lengthen the springs only half an inch, and a satisfactory frame may give trouble. Possibly the cross member would need to be moved only a small fraction of an inch to work in harmony with those springs.

But unless that small change is made the truck is doomed to a short life of usefulness. You should feel confident that in the truck you buy each screw, each nut and bolt has been carefully studied in the light of actual performance and placed in its proper relation to every other screw, nut and bolt in the truck. That is another thing you should learn about any truck you consider. Has it proved its ability to withstand the service you will require of it?

The average truck utilizes only a small part of the power developed by its motor. Even that small part is greatly reduced when the truck is starting, pulling on a grade or running less than eight or ten miles an hour. Wasted power means excessive operating application and actually delivers more than 90 per cent to the rear wheels—where it drives the truck and is not consumed in overcoming internal friction and resistance.

The performance of most trucks depends to a large extent upon the care and attention of the operator—and many drivers are negligent and careless. You should get a truck simple in design, with no unnecessary parts to get out of order. It should be as nearly fool-proof as a piece of machinery can be made. Every hour spent in the shop or delayed for roadside repairs is a dead loss to the owner. The truck that shows a profit is the one that gives uninterrupted service. It must stay always in service, without needless delays because the driver thinks “she’s not running just right and has to be ‘tuned up.’” A truck that



FIVE-TON WHITE TRUCK WITH SIDE OPENING

must be frequently “tuned up” is too delicate to meet the requirements of those who must have dependable transportation.

Simplified design is a factor in reducing gasoline consumption and running costs. It reduces the necessity for repairs, as there are fewer parts; and inexpert mechanics delight to tinker with adjustments—frequently necessitating a costly interruption in service. Your truck should be so designed that adjustments that invite tinkering and tampering are eliminated. A great many parts could well be eliminated from the average truck. It should be exceedingly simple, practically fool-proof.

The average driver fails to give proper attention to the many grease cups and places to oil found on most trucks, and unnecessary places to lubricate means unnecessary time—and expense—spent in oiling and greasing the truck. Neglected lubrication will soon send any piece of machinery to the junk pile. This has probably been the greatest factor in truck destruction. The truck you buy should have the fewest possible grease cups and spaces to oil. Wherever possible automatic lubrication should protect against carelessness and neglect.

You will find some of these features in almost every truck. In some trucks you will find many of them. But you may feel sure that very few builders can put out a commercial car of such high quality at a price which would prove a good investment value for the average user. You should insist upon a truck which is proving its value in a large number of lines of business. If it is a good truck, its value should be recognized throughout the country.

When you select a truck insist that it embodies all of these things—at a moderate first cost. To be good, a truck need not necessarily be expensive.

Another essential to which the ice dealer should give attention when purchasing trucks, is the reputation of the truck factory, its business life and the probabilities for its continuance. Ice dealers have paid dearly for the experience of buying trucks from short-lived concerns that die, leaving a trail of "orphan" trucks behind them. A permanent factory makes a "going concern" of its trucks and insures for them a good resale value.

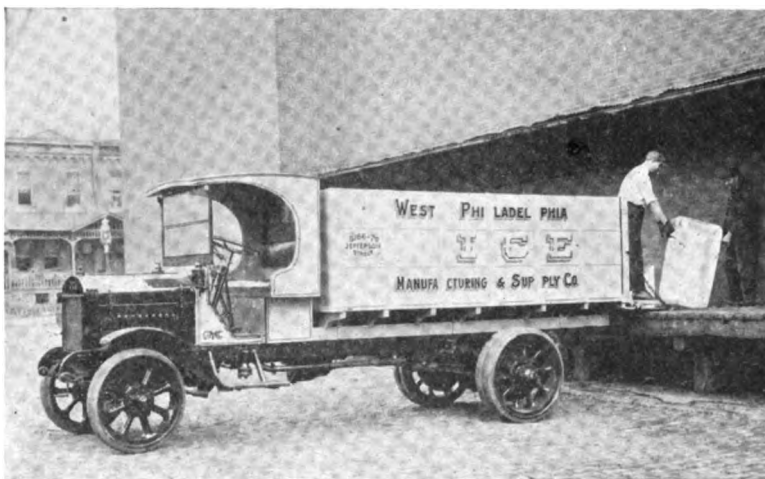
In the last analysis, the value of any truck to an ice dealer is not based on its first cost, but solely on its ability to render efficient service over a period of years with minimum operating and maintenance charges, or in other words, at the lowest ton-mile cost over a period of years.

**The Unit Mile.**—The increasing need of accurate cost data on truck operations, and for comparative work value of different trucks, or for the same trucks at different times, or trucks making similar deliveries with different drivers, has led to the development of a unit of measure for comparative purposes.

Simplicity in methods of truck comparison is desirable, if practical, but they must be practical.

To compare the work of two trucks by considering only their daily mileage is no more practical than to compare the work of two engines by considering only their speed in revolutions per minute, because there are other elements quite as essential to a day's work.

At present two important items are considered, load units and mileage. It is the various combinations of these two factors that make up the truck's work. Usually a truck making short trips has a large daily tonnage but low daily mileage. When making long trips its daily tonnage is low and its mileage correspondingly high. The actual work might be nearly equal in both cases, but not when viewed from either a mileage or tonnage standpoint.



TYPE OF G M C TRUCK USED BY PHILADELPHIA COMPANY

The two factors taken together have become known as the unit-mile, which can be defined as the work performed by moving a unit of load, for instance "ton," one mile. Any load unit may be used with results as follows: "ton"-mile, "yard"-mile, "gallon"-mile, "M" or thousand foot-mile (referring to the work of hauling a thousand feet of lumber one mile), "package"-mile, etc.

Suppose a truck travels from A to B, a distance of five miles, and carries one ton. This truck has then performed five

ton-miles of work. If it had carried three tons it would have accomplished 15 ton-miles. Suppose it now returns empty to the starting point. It has run miles but carried no tons so there can be no ton-miles. This fact has caused most of the misunderstanding of this subject.

It is not always practical in the ice business to weigh the load and measure the mileage as each piece is delivered. To follow the definition literally such practice would be necessary, but being impractical we must change the method to produce a result as near right as possible and still keep our process practical.

These two conditions have led to the use of two unit-mile terms. The "absolute" ton-mile is the result when following the definition literally. The "commercial" ton-mile is the result when observing the practical rule below. For some time the term commercial was used with a method advocated by the *Commercial Vehicle*, but that method was discarded on August 1st, 1919, for the one practised by the Packard Motor Car Co. The word "commercial" will continue in the future to distinguish the result from that obtained by the absolute method.

The fact that most trips are divided into two parts, an outgoing and return, and that the majority of trucks run empty or with very light load on one of these, has led to the following method for determining the commercial ton-mile:

**Five Miles**

A B

---

One ton carried five miles is five ton-miles.

**Five Miles**

A B

---

Three tons carried five miles is fifteen ton-miles

**One Mile**

A B

---

Five tons carried one mile is five ton-miles.

Multiply the total units in the period to be measured by one-half the average trip distance. This period may be a trip, day, month or any length of time.

The same result can be found by multiplying the average load per trip by one-half the miles traveled in the period.

Suppose the period is one day, the mileage 48, and the tons carried 24. The truck makes four trips.

First method—24 (units)  $\times$  6 ( $\frac{1}{2}$  average trip) equals 144.

Second method—6 (aver. load)  $\times$  24 ( $\frac{1}{2}$  total miles) equals 144 ton-miles.

*Note*—If a truck carries a load on both sections of its trip, follow the method above without change, for the average load will be the average carried out plus the average carried in.

Other conditions being equal—cost per day will depend on daily mileage. It increases with mileage.

Cost per mile will depend on daily mileage. It should decrease as mileage increases.



ICE WAGON BODY MOUNTED ON INTERNATIONAL CHASSIS

Cost per unit will depend on truck capacity and distance hauled.

Cost per unit-mile will depend on truck capacity and daily mileage. It should decrease with either an increase in capacity or an increase in daily mileage.

**Determining Cost of Truck Operation.**—With the growing use of motor trucks, a real problem, that of knowing just what it is costing to haul ice, confronts the dealer. It has been estimated this expense amounts to from forty-six to sixty-six per cent of the cost of the ice. Anything entering so largely into



the price of a dealer's product is worthy of considerable attention. To arbitrarily figure this percentage as the cost, however, does not cover the situation. Without definite figures and information there is no way of knowing it is not more.

In case the cost is lower than the forty-six per cent the dealer should also know it, for, while it would of course not lead to the same end as paying too much for hauling, it would enable him to meet competition on a firmer basis. In other words, it would give him the "edge" on a competitor whose transportation was not on such a satisfactory basis.

An accurate record of the truck's daily performance must also be obtained. This includes loading time, running time, available but not used time, miles run, tonnage carried, and number of trips. The information must be recorded plainly so that a glance at the record sheet will give a clear idea of what the truck is doing. The system must not be complicated and must require little time to fill out and keep up.

Right here is a good place to correct a fallacy which is probably more prevalent in the ice business than any other line, and that is that a truck or team laid up in the garage or stable is really, after all, in the first case, costing nothing, and in the latter case only feed for the horses. One of the main functions of a comprehensive system is to show just what all this idling is really costing and allow the dealer to adjust his business accordingly.

A record of itemized *real* truck costs and daily performance can result in but one thing—better trucking. It not only brings out the good, but clearly shows the weak spots. When a dealer has the definite information it supplies he can apply the proper measures to correct difficulties. He doesn't have to work in the dark.

Realizing the necessity for accurate cost data concerning the operation of motor trucks, the Truck Owners' Conference, Inc., a national association of truck owners, effected a cost system which is known as the "National Standard Truck Cost System." It is a system designed for keeping a complete record of everything pertaining to truck operation from the time of its purchase until its final disposition. The entire system, sufficient for one year, including a daily record, monthly analysis of operation, cost and tire record, and monthly analysis of cost, is put up

in the form of a folder and can be purchased from the association. In connection with the system daily service record blanks can also be obtained.

**CITY DELIVERY CO.**  
**DAILY TRUCK-REPORT**

Truck No. 3 Date 10/16/19

Driver O. Ballou Gas 12 Gals. 3.00

Helper \_\_\_\_\_ Oil 4 Pts. 30

Grease \_\_\_\_\_ Lbs. \_\_\_\_\_

Repairs \_\_\_\_\_

Reading { 700 A. M. 5528.1

Odometer { 600 P. M. 5560.2

Wages 4.00

Hours in Use 7.40 Miles Today 32.1 Total 7.30

Trips 3 Tons Del 12.6 Cost per Ton Today .58 To Date \_\_\_\_\_

DESTINATION	ROUTE No.	ICE		TRIP	TIME		
		BLKES	POUNDS		OUT	IN	ELAPSED
6' x State	4	5	1500	1	9.30		
3' x Bros	3	18	5400	1			
15' x Scott	6	5	1500	1		11.00	1.30
Turner & York	15	10	3000	2	11.10		
Hubbards	Box	15	4500	2			
Kirkpatrick & Oak	18	3	900	2		2.00	2.50
9' x Barber	5	2	600	3	2.10		
22' x Bender	8	2	600	3			
14' x Clark	12	1	300	3			
Wright & Thayer	10	10	3000	3			
Wilsons	Box	12	3600	3		5.30	3.20
14' x Mann	6	1	300				
			25200				

FIG. 57.—DAILY TRUCK REPORT

However, the system was designed to cover truck operations generally and not any particular line of business. Therefore, many of the items included in the system would not be applicable

for use in the ice business, but the standard forms mentioned above in connection with a specially devised form for daily operation of trucks, could be used to advantage.

In the operation of motor trucks a daily truck report is essential in obtaining satisfactory results as to costs. The average driver is careless as to his time and the consumption of gas and oil. The best method of overcoming this expensive feature of truck operation is to make him account for his time every day and keep an accurate record of the daily consumption of gas and oil.

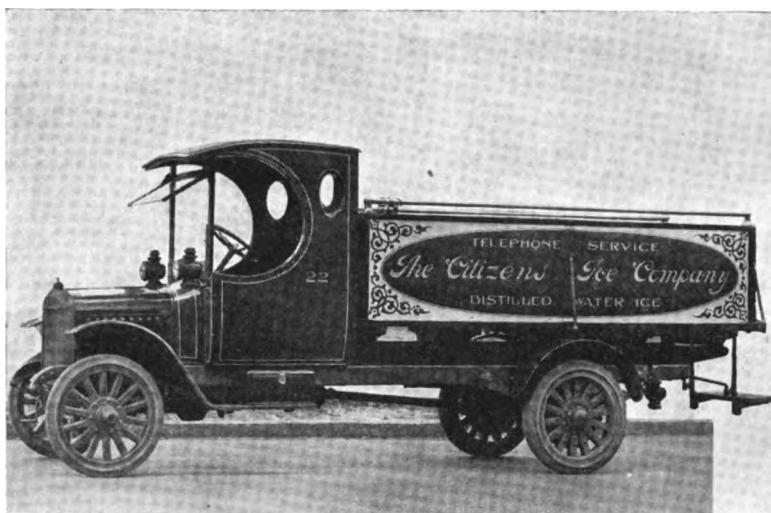
The form illustrated herewith (Fig. 57) has been found to answer the purpose very satisfactorily. It is used by the City Delivery Company, Little Rock, Ark., operating four  $3\frac{1}{2}$ -ton and one  $1\frac{1}{2}$ -ton Federal trucks, where many of the streets are unpaved, and many of the hauls are from five to seven miles from the plant.

Upon reporting for work in the morning the driver is given his report sheet, which is enclosed in a ring binder. He fills in his name, number of truck, and reading of the odometer. He then returns it to the order clerk, who enters therein the details for the trip, consisting of destination, number of routes, number of blocks, pounds of same, trip number, and the time of departure. Upon his return he turns in his sheet to the order clerk, who immediately enters upon it the time of his return, and the details for his next trip. This procedure is followed each trip until the conclusion of the day's work. At the close of the day's work the driver fills up his gas tank, and the number of gallons necessary to fill it is the amount charged against the day's operation, as the tank was full when he started in the morning. The amount of oil and grease used is also entered on the report by the driver; the other calculations are made in the office.

The City Delivery Company uses its trucks for supplying route wagons and a few heavy consumers. One of the hauls is to an amusement park located seven miles from the plant. It is an upgrade drive all the way out, and a rough, rocky road most of the distance. This trip was assigned in turn, as nearly as practical, to each driver. By this method a comparison of the time consumed in making straight hauls to the same place by the various trucks was possible and it soon developed that the

men were laying out to avoid this disagreeable trip. This was quickly remedied. Another feature brought out by the use of the report sheet was that wagon drivers would call for ice, and then bring back more than the amount delivered by the supply truck. Some of these deliveries were at long distances from the plant. This was also quickly remedied.

The report sheet is also valuable in other respects to that particular company, but its greatest value is its moral effect on the men. They know that each day there is a record of their



REPUBLIC TRUCK USED BY TOLEDO COMPANY

entire day's work in the office for comparison, one with the other, and that each driver's value to the company is judged thereby.

Such a form as illustrated (Fig. 27), or one containing whatever information deemed necessary for particular purposes, could be utilized in connection with the standard forms referred to.

The data derived from the Daily Truck Report could be recapitulated on the "Daily Record" in the folder for that particular truck. There are twelve sheets, one for each month, bound in the folder, each sheet ruled across for the days of the month, so that all the data for the day is entered on one line, a quick operation for the bookkeeper.

At the end of the month the totals from the Daily Record could be entered on the "Monthly Analysis of Operation." One sheet, ruled into twelve divisions for the month, suffice for this part of the work. On it is also space for daily averages on the various cost items, and from these latter are derived the four big items in truck costs: (1) cost per day operated; (2) cost per mile; (3) cost per unit barrels or pounds, as fits the individual plant's bookkeeping system; (4) cost per unit mile.

From these last four the owner or manager can arrive at exact costs on his deliveries, and from them he can also draw up the estimate, or budget, for the ensuing month or year, to be included in his other cost items of manufacture and sale.

The "Cost Record," to which the costs as found above are transferred, covers investment cost, fixed charges by month or by year (including such items as interest, taxes, license, administrative overhead, insurance, depreciation, etc.), maintenance and repair charges. It also includes a form for estimated charges or budget, as derived from past performances, and alongside it is a form for actual costs, as derived each month from the records above described. These final costs are reduced to four items: Maintenance and repair, tire cost, variable monthly expense, and fixed monthly expense. On this sheet also is entered the figures on estimated yearly maintenance and repair cost per mile operated and tire cost per mile.

This last item is gained from the final form, the "Tire Record," which covers completely all tire costs, and is, in fact, a history of each tire on the truck.

With such a cost system the owner or manager is able to compare one truck against the other as to detailed performance and itemized cost—thus determining which unit, size and type of truck is best suited to his trucking conditions; to compare the mileage and cost per mile of different makes and types of tires—to know which are best for his truck; to decide which drivers are the best producers; to check the trucks' repairs, gasoline consumption, etc.; to rent trucks on an equitable basis; to prove where it is less expensive to haul by truck than horses, and vice versa.

**Value of Comparison.**—Cost data, to be of value, must be cumulative, irrespective of what this data relates to. This in

turn must be in such form that it can be used for comparative purposes. Illustrative of this fact, the figures in Table No. 20, which are actual operating costs of twelve Packard trucks, are illuminating as to variation in operating costs and the reasons therefor. These figures are not selected because some of them are low, but to emphasize the lesson of efficient and inefficient operation and their relation to costs.



TRUCK WITH TRAILER USED BY MILWAUKEE COMPANY

Idleness is the largest factor in increasing operating costs of motor trucks. This fact is very clearly shown in the table in the column headed miles per month. Figures in this column show that only four trucks made over 1,000 miles in a month, and that several made less than 400, showing intensive use of the truck as against only partial use. The miles per day column also indicates these two tendencies.

Another fact shown by the table is that trucks can be used to good advantage in short distance hauls. This is shown in the trip distance column. The figures show that a six-ton

truck hauled 2,832 tons in one month at an average trip distance of 3.2 miles, at a low cost of  $13\frac{1}{2}$  cents per ton-mile.

The figures given in the table should be carefully studied by every user of a truck. While they are not figures of trucks used in the ice business, they afford a comparison of costs with those of trucks used in the ice industry. The form in which this statement is made up is also of value as a suggestion as to the data necessary, and the method of tabulating it.

If all truck owners in the ice industry would adopt the standard cost forms referred to on page 212, or a similar system devised specifically for the ice business, and tabulated their data in a form similar to the table published herewith, it would be possible, in a short time, to obtain facts regarding operating costs of trucks in all sections of the country in such form as to be available for comparative purposes throughout the entire industry.

**The Selection of Truck Drivers.**—There is no problem in connection with the operation of motor trucks that requires more careful consideration than that of securing a driver who can be relied upon to take proper care of his charge while it is in operation. It is considered by many that the question of drivers is paramount to any other, after the selection of the truck. It makes no difference how expensive the machine may be, or how careful its use may be planned, if the driver is not careful, and does not co-operate with the owner in carrying out the instructions given him, poor results will be obtained.

In almost any other business activity, subordinates perform their work without it being necessary to delegate to them the power of deciding important matters of judgment. The truck driver occupies a different position. He may be thoroughly instructed as to his duties, and the owner may feel reasonably sure that his instructions will be carried out to the letter, but it must be remembered that as soon as the truck has left the garage, the driver is thrown entirely upon his own judgment. He has complete control of the investment, which may be from one thousand dollars to eight or ten thousand dollars. If the driver's judgment is bad in time of emergency, it might result in total destruction of the truck and loss of life.

In addition to this there are other important things to con-

TABLE XX.—SHOWING TABULATION OF FIGURES CONCERNING OPERATIONS OF TRUCKS OF DIFFERENT TONNAGE

Owner Number	Capacity	Month	Miles per Month	Miles per Day	Cost Trip per Day	% of Capacity	Tons per Day	Cost per Ton-Mile	REMARKS
371	1½ Tons	June 1918	387.5	15.5	6.53	28	60	.66	245.7
		July 1918	374	16.2	7.31	3.1	66	.70	238.2
		August 1918	467	20.3	6.89	3.9	53	.83	190.1
1118	1½ Tons	Feb. 1919	1394	55.8	16.91	11.2	86	1.32	320
		March 1919	1112	48.3	17.87	10.3	83	1.50	275
		April 1919	1170	49.4	16.91	10.9	86	1.39	292
1095	2 Tons	March 1919	582	27.7	17.70	3.1	27	1.92	193.3
		April 1919	615	25.6	16.72	2.8	25	1.62	249.0
		May 1919	664	26.5	18.05	3.1	27	2.10	215.6
960	2 Tons	May 1919	1097	42.2	8.97	7.7	62	.65	458
		June 1919	1158	46.3	9.02	8.4	65	.63	359
		July 1919	1296	49.8	9.67	8.1	65	.61	409
982	3 Tons	May 1919	851	34.0	17.82	5.5	57	.83	535.5
		June 1919	749	29.9	16.42	5.4	69	.72	567.7
		July 1919	659	26.3	16.05	5.1	63	.83	484
22	3 Tons	Feb. 1919	689	28.3	12.22	9.1	63	1.03	285
		March 1919	707	27.2	12.30	8.0	58	1.02	312.5
		April 1919	707	27.2	12.30	8.0	58	1.02	312.5
1116	4 Tons	April 1919	331	15.0	20.52	2.8	41	1.16	387.8
		May 1919	618	22.9	22.12	4.1	49	1.06	598.1
		June 1919	470	22.4	20.67	4.7	45	1.19	364.2
1215	4 Tons	April 1919	687	28.6	16.00	4.4	62	.49	777.7
		May 1919	1124	44.9	16.70	3.5	66	.24	1682.3
		June 1919	969	40.4	16.08	7.4	63	.58	662.2
1095	5 Tons	March 1919	521	21.7	18.93	3.8	32	1.03	440.8
		April 1919	448	18.7	18.32	3.5	40	.84	524.5
		May 1919	511	20.4	21.25	3.4	42	.85	624.3
1213	5 Tons	Feb. 1919	508	24.2	16.17	6.9	48	.95	358
		March 1919	490	28.8	20.14	7.3	58	.88	386
		April 1919	679	37.7	21.86	7.6	54	.81	484
778	6 Tons	Feb. 1919	613	27.8	19.26	4.2	65	.37	1137.4
		March 1919	748	31.1	18.82	4.6	64	.37	1233
		April 1919	376	31.3	26.97	4.5	62	.59	625
1338	6 Tons	May 1919	1162	44.6	20.70	3.9	51	.29	1837.2
		June 1919	1224	48.9	20.76	3.8	51	.26	1991.9
		July 1919	1446	57.8	24.03	3.2	51	.21	2832.3

A low daily mileage with the average load capacity indicated raises the ton-mile cost to nearly double the next truck of the same capacity, which has a high daily mileage and high load efficiency.

Truck 1095 uses a helper, has a 20 per cent per year depreciation charge and carries heavy insurance. This accounts for its high daily cost as compared with truck 960. With the high daily cost of 1095 is a low daily mileage and low load efficiency.

The difference in cost per ton is due to a difference in trip distance. A high administrative overhead and insurance causes 982 to cost more per day and per ton-mile than 22.

The lower load efficiency and daily mileage and the use of a helper on 1116 makes its costs per day, per ton, and per ton-mile much more than those of 1215.

With a greater daily mileage and load efficiency 1213 shows a lower cost per ton-mile than 1095. The cost per ton on 1095 is greater than 1213 because it uses a helper without accomplishing enough extra work to counteract his cost.

Higher insurance and garage rent for 778 accounts for its greater proportionate cost per day. The effect of greater daily mileage is clearly evident in the ton-mile cost of 1338 over 778.



sider. A truck, with its more or less intricate mechanism, capable of negotiating all kinds of roads, carrying cargoes weighing thousands of pounds, must be given consideration so as to obtain the greatest return in service for the investment. In this particular, the driver's control is again almost absolute. Bad roads may increase the strains which are at work on a truck. It may increase the hardships which are always present many times beyond the average. If there are bad roads on account of weather conditions, or if it is known by the driver that his route will take him over a stretch of bad roads, these facts should be considered by him when loading, as under such extraordinary conditions, the truck may be put to a strain amounting to seven or eight times the normal. Nothing in engineering can take care of such a wide range of strains, and there is practically no mechanical protection against over-loading and over-speeding. This is only one of the multitudinous problems which the driver has to decide for himself, any one of which is an important factor in the successful operation and life of the truck.

Caution, judgment, the qualities which come with age or a settled position in life, are desirable in the selection of a driver; and further, in hiring him, it is well to ascertain if the applicant is physically fit. A man who is nervous or high strung is liable to take his temperament out on his car; and even here the investigation and selection of the driver should not end. The employer must remember that the driver is to represent him or his company in dealing with customers and that he should be a man who is courteous, and who can converse in a reasonably intelligent manner in addition to being able to handle his truck competently.

Finally, after the employer has exercised the utmost care in selecting his driver, he must realize that much depends upon the manner in which that driver is instructed, and further, in seeing that all instructions are carried out. The success of the truck driver as such often lies in his early training, and, therefore, a part of the responsibility must be shared by the employer.

If the driver takes an interest in the truck, keeps it in good condition, and does not let it get out of repair—does not overload it, the truck will give long and faithful service.

But, on the other hand, if the driver takes no interest in the truck or its condition—drives it carelessly—overloads it—

paces the motor and clashes the gears, the truck will suffer and its life will be shortened.

So the truck owner should pay as much attention to the driver of his truck as to his investigation and his choice of trucks.

**Cutting Expense of Labor Turnover.**—Several firms who own fleets of trucks have instituted a bonus system by which excellent results have been accomplished.

Under this system the driver who gets the most service out of his truck with the least expense covering a definite period of time, receives a bonus. It makes a good driver out of a poor one and makes a good driver even more careful. It also has a tendency to cause them to stick to their job.

It costs about \$3,500,000 a day to pay the wages of truck drivers of the United States—figuring 700,000 trucks at an average of \$5 a day, which, by the way, is probably low, says *Hi-Ways Transport*.

Figuring on this basis, if the labor turnover—caused by men not sticking to their jobs—amounts to one per cent, it means a cost of \$35,000 a day, because the first few weeks or months a new man works are a plain loss. Until he learns the job he is worth practically nothing.

If this labor turnover could be eliminated it would save the fleet owners of America \$35,000 a day—over \$100,000,000 a year—and it is with a thought of this kind in mind that one delivery superintendent has worked out a plan for cutting down this expense.

Properly he begins at the beginning and tries to pick the right type when he hires his drivers. This is the type of man he picks:

1. Medium sized, not a big man, nor a small man; should weigh from 150 to 170 pounds.

2. Courteous, but sure of his purpose in conversation.

3. Clear-eyed, and quick to smile pleasantly, when appropriate occasion offers.

4. Clean, but not addicted to fancy clothes.

The one he turns down is:

1. Overweight, and slow or awkward appearing.

2. Likewise the man who is too small.

**Driving the Truck.**—Norman Smith, General Superin-

tendent Trucks and Garages, Consumers Co., Chicago, gives some advice on driving, in which he says that to the experienced truck driver it resolves itself into a series of movements which to him have become mechanical. One might say that driving to him is a habit and the operations of accelerating and gear shifting and braking at the proper time are accompanied by little actual thinking. Practice at the wheel, and above all adherence to every rule promoting safety, have made him a good driver. It is characteristic of the good driver that he is careful. He drives slowly compared with the beginner; he drives down steep grades in second or first speed; he turns slowly; he starts and stops gradually. All of the things that the experienced driver does are good for him, the other users of the road and for the mechanism of the truck.

Take such a simple matter as holding the steering wheel. While many different positions of the hands are possible, the good drivers say that the wheel should be held so that the hands indicate twenty minutes after ten, assuming the wheel to be the face of a clock. Some find that the wheel held in another position is easier for them. In watching a great many good drivers the writer has found that the position indicated is used more extensively than any other. This is not to say that you must hold the wheel in that fashion, if you have already accustomed yourself to a more comfortable one. The beginner grips the wheel at opposite sides, the lazy driver holds the wheel at the bottom only. While acquiring the driving "habit" one may as well get things right.

It is not uncommon for the repair bills to be in direct ratio to the number of different people who drive the same truck. Much money can be saved by proper handling, and that is why the beginner and extra driver are apt to injure the engine and gears in a very short time. The clutch should never be engaged harshly—that is, with a jerk. If the jerk is severe it is likely to cause breakage of a bevel gear, and besides it strains every other part of the driving mechanism. Starting from a standstill should be very gradual. There is no need for attempting to attain 10 miles an hour in a few seconds, just for the sake of speed. Starting should be slow and the gear changes made slowly and without clashing.

In the average sliding gear transmission of today there are

two shafts. The main shaft is made in two sections. The forward section connects direct to the clutch and is usually a large drive gear. The rear section of the shaft is fitted with two sliding gears, both of which are keyed to the shaft. The countershaft is fitted with four or more gears, one of which is meshed with the driving gear and the rest are all keyed tightly to the shaft. As long as the clutch is in and the driving gear rotates, this countershaft rotates with it, and the countershaft ceases to rotate only when the clutch is thrown out.

The sliding gears and the other gears on the countershaft are of various sizes, and are designed in such a way as to offer various gear ratios for selection.

With the engine running, the two sliding gears on the main shaft are at neutral, neither of them meshing with the countershaft gears. These sliding gears are stationary because the car is not moving, but the countershaft gears are traveling at a certain rate, depending upon the speed of the engine. If either of the sliding gears were to be meshed with the corresponding countershaft gear, the teeth would be stripped from either or both gears. So the clutch must be thrown out, and when this is done the countershaft ceases to revolve. Then the low speed sliding gear can be meshed with a gear on the countershaft. In this ratio the gear on the countershaft is smaller than the one that meshes with it.

The clutch is thrown in, the countershaft starts to revolve and drives the main shaft, moving the vehicle forward at low speed. When sufficient headway is attained, change the low speed ratio for a different ratio, that is, slip the low speed ratio gear out of mesh with the countershaft gear and mesh the intermediate sliding gear with its corresponding countershaft.

This operation cannot occur without damage to the transmission until the clutch has been released. As soon as the clutch is released, the countershaft is carried along by the speed of the car, through the sliding gear. The low sliding gear is then slipped out of mesh. Then the countershaft loses speed and it is time to mesh the intermediate speed.

Now the intermediate speed gear on the countershaft is only slightly smaller than its corresponding gear on the main shaft, and can be meshed as soon as the countershaft speed slows to the

speed of the main shaft. Since the tendency of the countershaft is to slow down, its change can be made with but little noise.

After intermediate speed has been attained, the clutch again thrown out and this same intermediate gear is moved forward, only it locks with the portion of the main shaft or driving gear as before. The change can be made with a minimum of noise, for the reason that the driving gear has a tendency to lose speed and conform to the speed of the main shaft which drives the wheels.

Most drivers make the change from low to high without much noise, but the real trouble comes in the change from high to intermediate, or from intermediate to low speed, because when the car is running at high speed the driving gear is running at main shaft speed.

When the clutch is thrown out the main driving gear loses speed and if the intermediate is thrown in a grinding noise results, because the intermediate gear ratio requires a faster countershaft speed than is being developed.

In changing from high gear to intermediate or to low, the main drive gear and countershaft must be speeded at a higher rate than ordinarily. To make this change noiselessly, the operator should throw out his clutch, change the gears to neutral and speed up motor, then let in the clutch for a second until the countershaft has attained a high speed, throw out the clutch again and mesh into intermediate.

In changing from intermediate to low, the same procedure must be gone through. Only a second is required to bring the speed of the driving gear up to as high as required. A tap with the foot upon the accelerator is sufficient.

Do not, however, forget to throw out the clutch before meshing the gears.

Driving up and down grades is, to the experienced driver, no more trouble than driving along a level stretch. There is no need to burn brake lining unnecessarily when going down grade. As a matter of fact, many grades do not require the use of brakes at all, though most drivers use them. There are two forms of resistance which can be put into use to retard the motion of a truck—the brakes and the engine (when it is not firing). The greater the engine speed when the engine is not firing the greater the resistance it offers, so that if the gears are in second speed

the car will roll down a hill slower than in high. In first speed the speed will be slower than in second. The brakes should not be used on long grades unless the truck travels too fast in first speed. Then the brakes may be called on merely as auxiliaries. The next time you have occasion to travel down a steep grade shift into first speed turn the ignition switch to "off" position and hold your foot on the brake pedal, but do not apply the brakes. You will find you have the truck under complete control and that the brakes will not do one-tenth the work they formerly were called upon to do.

There are certain fundamentals of driving which are perfected through continued use. Brake application usually is considered the easiest of operations; yet you no doubt have seen drivers stopping too short and almost throwing the rear end off the ground. Brakes should be applied evenly and progressively. Pressing down hard on the brake pedal will stop the car, but it is not the best thing for the mechanism.

In ascending grades many drivers keep the gears in high until the engine begins to labor and then the shift is made. This is wrong; the shift should be made before the engine labors. Some drivers insist upon their trucks taking every grade on high with the result that the engine simply knocks until the crest is reached. There is no need for this.

A mistake often is made by many drivers in assuming that they are better off if a rough grade can be made in high when the car is going fast. You will find that where the road is rough, as a cobble road, the slower you ascend the better it will be for the rear tires. When you ascend quickly the rear wheels bouncing up and down grind off tread rubber.

The majority of so-called troubles are directly traceable to abuse, carelessness, a lack of understanding of these principles and improper handling in general.

Do not assume an attitude of "so long as the truck moves that's all that is necessary." It is not.

Always be sure you have the proper amount of oil in the motor. Better too much than not enough. Keep the gauge above the half full mark at all times. Allow it to go below and you are risking burned out bearings, scored cylinders or other serious damage to your motor.

**General Road Operation.**—If the following rules are observed in connection with driving trucks very little trouble will be experienced, accidents minimized, and wear and tear on trucks greatly reduced:

Always start on low gear.

Use all gears in starting.

If trailer or tow is attached, take up the slack very slowly to prevent shock.

Slip the clutch only when necessary to make a smooth start. Remember, this is a bad practice, often causing burned-out or glazed clutch discs.

When driving with foot accelerator, set the throttle lever to give just sufficient throttle opening to prevent the engine from stalling should the foot be removed from the pedal for braking.

The fact that the engine speed is governed does not mean that the truck should always be operated at the maximum speed. Less haste means more speed in the long run, especially when the roads are bad.

Slow down for turns; it saves tires and avoids skidding.

Shift gears to lower speed when driving slowly in traffic.

Use highest gear possible for sand and keep the truck rolling, but do not permit the engine to knock.

Never wait until the engine knocks before making a gear shift to lower speed.

In climbing grades shift to lower gear when motor begins to labor.

Stop gradually, as a sudden violent application of brakes produces excessive wear on the tires and undue strains upon the chassis. On leaving the truck when stopping, always be sure to throw running switch to "off" position and remove switch key. **Safety Always.**

Never allow controller to rest between speeds, but move handle swiftly from speed to speed.

Never run continuously on first speed, as it includes a resistance which would become overheated; first is a starting speed only.

In changing to lower speeds while running, always pull controller to the "off" position, and when truck slows down to the desired speed, move controller quickly to the corresponding lower speed position.

If for any reason it is necessary to pull off the controller momentarily, without appreciably slowing the speed of truck, always reapply the power by moving controller to the previous speed position.

Never reverse the controller while the truck is moving.

Anti-skid devices are intended for soft mud or snow and if used should be removed when the wheels cut through to hard road surfaces. Do not under any circumstances grind these devices between rubber tires and hard road surfaces.

When snow falls, or roads are icy, see that your truck is equipped with:

One shovel.

One box of sand or cinders.

If the wheels do not take hold use your shovel and sand or cinders.

Do not run fast around corners when the streets are slippery. Do not drive down hill any faster than you can drive up! This is very important. Always remember that the ability to start or stop depends upon the condition of the traction between the tires and the road.

Do not allow tools, wire, bolts, etc., to accumulate anywhere except in the tool box. Never lay any metal on battery or in controller box.

In the morning be sure battery is fully charged, see that the charging plug is removed, battery doors fastened and test brakes before leaving the garage.

At night always leave controller handle in "off" position, remove the running key and set brakes before leaving the truck.

Before leaving at night turn in a short report of anything needing attention.

Read and study carefully the "Motor Vehicle Law."

The auto truck is a delicate piece of machinery. It should be operated in such manner that its life will be prolonged and that it will be maintained at reasonable cost. It is also expensive both in first cost and operation—see that it does a good day's work every day.

**Overcoming Hot Weather Troubles.**—In hot weather lubrication is to a truck what perspiration is to the body. Each reduces heat.



But perspiration is automatic and, unfortunately, all lubrication is not. Therefore, the health of your trucks depends upon the attention and care your drivers give them, not only as regards lubrication, but in other ways.

Oil and grease thin out and seep away more rapidly in hot weather than in cold. Therefore running parts must be lubricated more thoroughly and more frequently in hot weather. The fan should be kept clean and well greased. Difficult grades can be made with greater speed, less heating and less fuel consumption in intermediate speed than if the engine is permitted to labor in high to the point of stalling. The exhaust should be kept clear of obstruction, and mud or dust should not be allowed to cake on the muffler or clog the outlet. The radiator should be filled more frequently and always with clean water, using the best quality of rubber hose. The inside of cheap tubing is apt to dissolve and the rubber particles clog up the system. When a heavier oil is used, because of hot weather, care should be taken not to work the engine too hard before it is warmed up.

The main points which require attention during hot weather are briefly outlined by A. F. Masury, chief engineer of the International Motor Company, as follows:

1. Do you understand the truck's cooling system thoroughly? If not, go over it carefully and find out all there is to know about it. See that the flow of water is not impeded by any sort of obstruction and that the overflow pipe is not bent below the level of the base of the radiator filler. Be sure that the overflow pipe is not clogged or flattened.
2. Is the radiator clean? The front of the radiator should be free from dirt, license plates and signs. Also, the back of the radiator should be unobstructed so that nothing will impede the circulation of the air.
3. Are the hose connections water-tight and is the hose in good condition? Be sure that the rubber has not been affected during the winter by an anti-freeze solution. Only the best quality rubber hose should be used, as the inside tubing of cheap hose is easily worn away and the rubber particles carried along with the water clog up the radiator.
4. Does the fan turn freely and is the belt tension right? The fan should be clean and its bearings should be well greased. A good test is to turn the fan by hand with the engine shut off. If it is possible to slip the belt easily, but not possible to spin the fan, the tension is right.
5. Is the carburetor choke in proper repair so that it opens all the way? Better open the seasonal shutter on the hot-air tube. Is the float level correct? If too high, slight flooding will cause an over-rich mixture.

6. Does the ignition system furnish a spark of sufficient strength? A weak spark due to excessive lubrication of the magneto, dirty breaker or distributor, or weak magnets, will have an effect similar to late spark timing and overheating will result.

7. Are the valve tappets properly adjusted? They should have from .008 to 0.10 inch clearance, which may be gauged by about the thickness of an ordinary post-card.

8. Are the cylinders free from carbon? If not, remove it.

9. Is the oil in the crankshaft clean? Gasoline, dirt, or other foreign substances will impair the quality of the oil in the crankcase, resulting in overheated parts due to insufficient lubrication. The oil reservoir should be drained every 1,500 miles, the walls thoroughly cleaned, and a fresh supply of oil should then be put into the crankcase.

10. Are you using the right grade of oil? Because of the increased temperatures it is often advisable in summer to use a heavier grade of oil than in winter.

11. Are the exhaust pipe and muffler clean? Practically 40 per cent of the heat of combustion escapes through the exhaust. It follows, therefore, that if any part of the exhaust system is obstructed, a part of this heat must be carried off by the cooling water, which will naturally raise its temperature.

12. Are the brakes free? A dragging brake will cause overheating in hot weather that might not occur in cool weather.

**Operating Trucks in Cold Weather.**—During cold weather attention should be paid to the water in the cooling system to prevent freezing, the results of which may be a cracked radiator, water pump or cylinders. Proper precautions prevent this. Use a good anti-freeze solution. A gasoline motor works most efficiently and economically when the temperature under the hood of the truck is equal to summer heat.

A cold motor causes condensation of the gas ready for explosion in the cylinders. Much of this may pass by the pistons, dilute the oil in the crank case, and so make it a less efficient lubricant. Unless oil being so thinned is frequently changed, heavy wear to cylinder and piston parts results—this necessitates expensive replacements. This is also true where the mixture used is too rich either when running or when starting; especially if the motor is cold.

During cold weather always idle the motor in the garage for a few minutes before starting out. The heat thus generated will then allow the motor to run outside with the carburetor adjustment normal and will secure the greatest possible gasoline

efficiency, together with the most satisfactory lubrication. If the truck is operated with the carburetor adjustment at or near choke position, it will waste gasoline, accumulate carbon and give other unsatisfactory results.

Remember the radiator can freeze when the truck is running if no anti-freeze solution is used, or if the glycerine or alcohol are not in proper proportions, so it is best to have a covering for the radiator in cold weather. The most practical thing is a radiator cover. Do not use a piece of cardboard wired through radiator cells. The wire wears them until leaks develop. A good cover doesn't cost much and more than pays for itself.

Keep the radiator and hood well covered whenever motor is shut down, and during very cold weather do not permit the motor to stand idle more than twenty minutes. If necessary to stand longer, start the motor and let it run about five minutes with cover down; this will warm it sufficiently to stand another like period.

The first sign of a frozen radiator is steam. As soon as it appears the driver should stop his car immediately, raise hood and place hand on lower part of radiator on the motor side. If warm there, the water is overheated, possibly due to lack of water, or the radiator cover might not be opened sufficiently. If cold, the radiator is frozen.

If frozen, slip off the fan belt, cover radiator and hood tightly and keep running, providing the motor does not get too hot. There is a possible chance to thaw out a slight freeze if it is caught in time; at least it will prevent freezing harder. If this does not succeed, attempt to get the car in a garage, but watch the motor carefully, and should it get too hot, shut down and let it cool before starting.

Remember, you must watch the oil closely when motor is overheated, to prevent seized pistons and burned bearings.

Never fill radiator with cold water when motor is overheated; also do not put boiling water in a very cold motor. Either is likely to cause a cracked cylinder. Never hold a lighted match over radiator spout to see whether it needs water, as there is danger of an explosion on account of the alcohol in the anti-freeze solution.

Never remove the cap when radiator is blowing steam, as the boiling water will shoot out and is liable to seriously burn

you. When steam is under pressure in radiator, shut down the motor and the surplus steam will escape through the overflow pipe; when this stops the cap can be removed without danger.

Use extra care in driving over rough places, as extreme cold affects the steel in the springs, causing them to break more easily.

The Bureau of Standards, Washington, D. C., advises that kerosene, due to the inflammability of its vapor, makes it dangerous to use, and its high and uncertain boiling point might lead to the serious overheating of the engine, or even to the melting of the solder in the radiator. It also has bad effect on rubber connections.

Calcium chloride compounds have a greater corrosive action than water on the engine jacket, on the solder in the radiator and on aluminum, which is sometimes used in manifolds, pumps and heaters. A number of tests were made by the bureau and each showed that there was a more rapid corrosion or eating away of solder in these anti-freezing compounds than in water. Calcium chloride solutions also cause small leaks in the radiator, the water jackets or connections, and so the solution comes in contact with the spark plugs and ignition wires.

The department recommends glycerine and alcohol in equal proportions mixed with one-third solution and two-thirds water as the proper anti-freezing solution. The exact proportions are  $17\frac{1}{2}$  per cent alcohol,  $17\frac{1}{2}$  per cent glycerine and 65 per cent water. The alcohol and glycerine already mixed can be purchased in containers ready to be poured into the radiator. By draining off some of the original mixture enough of the mixture of glycerine and alcohol can be added from time to time to maintain anti-freeze effectiveness under all conditions.

**Getting Maximum Value From Trucks.**—Give your motor truck a chance to live through a long life. Don't drive it to destruction and the scrap heap. Inspect it occasionally, keep it well oiled and tighten up loose joints. Some timely advice is offered by the B. F. Goodrich Rubber Company, who instituted a national educational campaign on motor truck operation.

Getting the maximum value from a truck is largely a matter of maintenance versus depreciation. The life of a motor truck may be prolonged surprisingly with proper care. Obviously, the quality of the truck must be considered—its construction—also

the character of the work it is called on to perform and the manner in which it is handled.

The motor truck must encounter ridges and depressions of road surface, edges of bricks, car tracks and scores of other obstructions. It converts these shocks together with the throbbing of its engine into a ceaseless vibration which shakes every part of its mechanism, from the radiator to the tail light. The different units of the truck with their various pipes, rods, gears, wires, valves and pumps must be attached by bolts, bands, screws, stays and supports, all of which must be kept tight and in perfect alignment at all times.

The operator must catch a squeak while it is a squeak. He must remove the cause of the trouble before it has developed a serious ailment. Inspection is the basis of truck maintenance.

In the majority of cases mechanical ailments spring up and develop into serious troubles before they come to the attention of the operator. In truck maintenance the work of repairing, replacing or adjusting the parts is secondary to the inspection which discovers what parts are in need of attention.

The first step in the constant search for mechanical troubles is to question the driver. He is operating the truck under all conditions of stress and strain, and symptoms of troubles come to light on the road which might remain hidden during the inspection in the garage. The most satisfactory way of obtaining the information from the drivers is by setting aside a space on the daily report card for this purpose. The driver's report furnishes the clew for a thorough inspection at the garage.

To decrease the maintenance of motor trucks, or to keep it down to minimum, it is essential that inspection should be made regularly, at least once a month. It makes no difference if there is but one truck in operation or a whole fleet, a regular inspection will go a long way toward reducing depreciation and cutting operating costs. It is advised that these inspections be made by an outsider.

Drivers and garage men may be skilled mechanics who understand the engine thoroughly enough to take it apart and put it together again, but there is always the possibility of making a big and costly mistake if the overhauling of the equipment is left to them. It may be their carelessness in operating which is

sapping the life out of your trucks, and it is hardly human nature to expect an employee to hand in a report which convicts himself of carelessness.

There is the matter of the speed governor, for instance. Most motor trucks are equipped with this device, which is supposed to prevent the driver from "hitting it up" at more than twenty miles an hour.

As mentioned elsewhere, speeding tends greatly to reduce the life of a truck. But many drivers have the speed mania to such a degree that they go to the trouble of surreptitiously detaching this checking mechanism. There is no type of governor which is absolutely foolproof. There is a way, however, of preventing your driver from tampering with the device. An inspector can seal it so that it cannot be unscrewed from the carburetor without breaking the seals. And if your driver knows that his offense is sure to be discovered at the monthly inspection he will probably leave the governor alone.

Ball bearings also require regular inspection. The ball run should be kept filled with graphite grease, and the rough or worn balls replaced with perfect ones. If this is left to your driver, however, he will possibly wait until there is a serious breakage before he takes any action.

The cooling system of your truck should be cleaned frequently or mineral deposits will form in the water jackets and radiator which in time will corrode and interfere with the cooling process.

These are but a few of the weaknesses which may develop in your equipment if it is not regularly looked over by a disinterested and efficient inspector. There are at least a dozen others. Even your tires will benefit greatly by proper inspection. Some of the better truck makers maintain an inspection service. If the owner cannot avail himself of this he should make an arrangement with the most reliable and competent local garage mechanic to do the work on a monthly basis.

A thorough inspection requires several hours. The inspector should make out a written report, or fill out a printed form, noting after actual test the condition of the various parts of the motor, governor, radiator, carburetor, ignition system, clutch, grease cups, transmission, steering mechanism, rear axle, chassis, body, brakes, tires, etc. This monthly report, besides detecting

incipient weaknesses, will reveal to the owner whether his driver is taking proper care of the equipment—whether the truck is being overloaded or otherwise abused.

An operator of a fleet of nearly eight hundred trucks recently declared that inspection decreased operating expenses by twenty per cent.

Inspection should be as frequent as once a month, but many fleet owners have their trucks thoroughly inspected twice a month.

Just as the physician determines from the pulse, the tongue, the eye, and the breathing, the condition of the patient, the expert mechanic diagnoses the condition of the motor truck from the squeaks, knocks, hisses, and pounds.

**Performance Record Profitable.**—Truck owners who operate three or more trucks will find it profitable to maintain a record of performance of each truck and post such records up weekly.

The Consumers Co., of Chicago, follow this plan and publish the list in "The Seal," a monthly house organ published by the company. The following extract clipped from one of the issues demonstrates the savings such a plan effects and, in conclusion, contains some hints to the drivers, that, if followed, will enable them to get in the honor column on the record board. The article contained the names of the twelve regular chauffeurs who made the records. The article in part follows:

A very decided increase in truck driving efficiency was obtained in the month of March as compared with the results obtained during the months of January and February. The average miles per gallon of gasoline made by our trucks in March of this year was 2.57 miles per gallon of gasoline, which was 0.17 miles per gallon higher than the average miles per gallon in February. The following table shows clearly the increase in miles per gallon of gasoline consumed for January, February and March of this year and also the saving in gallons of gasoline:

	No. Trucks Operated	Total Miles Covered	Gals. Gas Consumed	Av. Miles Per Gal.	Gals. Gas Saved
1921					
January .....	97	52,289	22,421	2.33	-----
February .....	99	49,049	20,248	2.40	735.0
March .....	86	47,839	18,574	2.57	1150.0

The increase in miles per gallon from 2.40 to 2.57 or 0.17 miles increase per gallon in March seems small, but when the saving of gasoline is considered, it means a saving of 1,150 gallons. This increase is

due to the efforts and co-operation of our truck chauffeurs. The chauffeurs deserving honorable mention for the fourth week's result in March are those who have been placed in the first column of our record board for having made between 3 and 4 miles to the gallon.

A few hints that will help you to make this first column are: Shut down motor whenever possible when truck is idle, for a motor when running idle and at its lowest speed consumes one-half pint of gasoline every five minutes. Shutting down the motor saves this gasoline and increases your miles per gallon. Do not race motor. Avoid speeding on rough roads. The motor should be driven with spark lever advanced as far as possible without causing back pressure. Do not be afraid to use gear shifts when necessary. Know your truck and its lubricator, for a well lubricated truck moves with less friction and therefore, less consumption of gasoline. Be sure that your truck wheels are in perfect alignment, so that the wheels are not dragging along instead of rolling along as they should. Have patience when starting, and do not pick up speed too fast, for this is very hard on the motor and also wastes gasoline.

#### **Comparative Records Favor Larger Capacity Trucks.—**

According to the records of one company, figures prove that the larger capacity truck is cheaper for its work. The manager states that their garage is in charge of a mechanic who looks after all cars. His wages amount to about \$12.00 per truck per month. Actual repairs have been low, averaging less than \$50.00 per truck per month. Estimated possible repairs are \$344.00 a year for the 3½-ton trucks, and \$300.00 for the 2-ton.

A comparison of the records of the 2-ton and one of the 3½-tons is given below. Only one of 3½-tons is represented because the work and records of all three are practically identical. The period covered is one year, during which both trucks worked 290 days and traveled 7,830 miles. Cost figures are based upon the National Standard Truck Cost System.

Size of Truck	Miles per Gal. Gas	Miles per Gal. Oil	Cost per Day	Cost per Mile	Cost per Ton	Cost per Ton Mile
2 -ton	6	154	\$12.56	\$.4653	\$.6979	\$.4653
3½-ton	5.5	156	14.43	.5343	.3559	.2372

The difference in the cost per ton and per ton-mile is noticeably in favor of the 3½-ton truck, showing that for their work the larger capacity truck is much cheaper.

**Danger of Overloading.** — Overloading increases the stresses in the weight-carrying members and may cause excessive breakage of these parts. In any good truck, normal weight,



hence normal stress, produces normal wear of moving parts. An excess will necessarily result in abnormal or excessive wear. A truck frame and other parts may be compared to a bridge. When a bridge is rated at so many tons, it means that it can carry that load with a certain margin of safety. It will carry more, but the margin of safety which was provided to take care of its depreciation in normal service will not be as large. The same is true of a truck.

Overloading decreases the ability of the truck to negotiate road conditions, since there is a greater weight to be moved per unit of engine power. A result is excessive gasoline consumption and slower operating speed; therefore, greatly reduced efficiency.

Overloading is a most disastrous abuse to a motor truck. Truck abuse, whether it be overloading or anything else, is a grievous offense against business, because it blocks the progress of transportation.

Railroads are very careful not to overload rolling stock. They know of the dangers of such methods. Bad freight train wrecks taught them that overloading railroad cars was a poor paying proposition. Brakes on an overloaded vehicle do not work properly. An overloaded truck running through congested streets is a menace to the public. A truck of large capacity, fully loaded, requires a maximum of skill and power to bring it to a quick stop, as is often necessary in our ever-increasing congestion of traffic. If a truck is overloaded, the operation is made doubly hard and the brake mechanism is called upon to perform a task for which it is not built.

If the truck owner insists on overloading his trucks, the axles, tires, wheels, springs, frames, brakes, transmission and engines of those trucks are going to be prematurely worn out and extremely expensive to maintain before they finally come to an untimely end.

In order to make a success of the system of motor truck transportation it is necessary for the trucks to be making a profit for their owners. The owners must be in a position from the start to know whether their trucks are making or losing money. An overloaded truck is never making a true profit. What it earns temporarily by hauling overloads it will lose in repairing and replacing the parts worn out by the strain. It will have to

be relegated to the scrap heap before its time, leaving nothing but a trail of waste in its wake.

**Lubrication Important in Securing Low Maintenance Cost.**

—Here's a startling fact, says Eugene Kelly—Observation has disclosed that ninety per cent of the truck parts replaced in a certain make of truck during one year were not worn out due to the usual wear of service, but were worn out thousands of miles before their expected life due to lack of care and lubrication—disinterested, careless neglect. The other ten per cent represented parts replaced because of normal wear after years of service and those made necessary by accidents beyond the control of owners.

Just how long and how satisfactorily a truck will operate depends more upon proper lubrication than upon any other feature of its care. The operator's obligations to see that instructions are followed must be discharged faithfully in this respect—excellence of quality will not lubricate. Bearing surfaces which when properly lubricated will give years of perfect service may be completely ruined by a few hours of neglect. Even slight neglect, not serious enough to immediately destroy, will have its damaging effect upon the mechanism and service, causing an increase of depreciation rate, loss of time, and a performance in general below that which should be obtained.

This, then, is the first obligation—to lubricate properly. The manufacturer calculates to a nicety of perfection the closeness with which the moving parts of the truck's mechanism are to operate. Between these moving parts he reckons on a slipping, cooling ointment, an infinitesimally thin coating of oil. When that coating is placed there practical perfection is attained. The parts scarcely touch each other. Friction is eliminated. The wear is cut to what the engineering mind terms the "irreducible minimum." But leave out the oil and what do you have? Instead of the smoothly slipping lubricated parts, you have one metal wearing on another, with exactly the same effect as a file.

"An ounce of prevention is worth a pound of cure" was never more true than in the case of lubrication. Even five cents worth of grease often means the saving of a \$50 part. It means, too, the continuous operation of the truck, as against the expense of being out of commission while the replacement is made.

Many claim they use plenty of lubricant. All right. But is the oil in the motor changed often enough? No one specific fault in lubrication is greater than failure in this respect. After a certain amount of use the lubricating quality of an oil is depreciated—partly by the mixture of escaping gasoline. The mere fact that a liquid remains in the crankcase, where oil was once placed, does not mean that that liquid is still a good lubricant. Attention to the changing of oil in the crankcase in accordance with the manufacturer's directions will avoid a tremendous and useless waste.

Lubrication, then, from a manufacturer's standpoint, may be summed up as follows:

1. It is the most important recommendation the manufacturer makes.

2. His recommendation is sincere, for the manufacturer wants his truck to run long and continually without repair expense. Under these circumstances the owner becomes the manufacturer's best salesman, and sales expense is cut down on future transactions.

3. The obligation to lubricate is the owner's in his own interest. The manufacturer can build a good truck and set down the practices under which assurance of long life and satisfactory performance can be given, but he cannot chase around after his product, from Kalamazoo to Madagascar, with an oil can.

**Loss of Lubricating Qualities.**—Destroying the lubricating qualities of the oil brings about many unsatisfactory conditions, for which there is no apparent cause. These conditions are usually difficult for the inexperienced driver to comprehend. Some of the troubles which are a direct result of the impaired qualities of the lubricating oil, are as follows:

- 1.—Hard starting.
- 2.—Premature piston wear.
- 3.—Premature cylinder wear.
- 4.—Premature piston-ring wear.
- 5.—Connecting-rod bearings burning out.
- 6.—Crank-shaft bearings burning out.
- 7.—Excessive gasoline consumption.
- 8.—Smoking, due to abnormal increase in the height of oil level in the crank case on account of gasoline working into the base of the motor.
- 9.—Excessive carbon in cylinders.
- 10.—Tendency to overheat, due to lack of lubrication.

11.—Very poor, or no compression.

All of the above result in lack of power and poor performance. This diluted mixture tends to soften the carbon, and practically makes a carbon-gasoline lapping compound which has a tendency to aggravate the wear already caused by parts running without adequate lubrication.

To eliminate so far as possible the above conditions:

1.—Keep motor free from carbon.

2.—Replenish regularly the oil supply in the engine base. For trucks in constant service, this should be done every week.

3.—Use choke sparingly.

4.—Do not adjust carburetor to give a rich mixture. This helps in starting, but the excess fuel eventually finds its way to the oil reservoir. Always make carburetor adjustments after the motor has run for some time and is thoroughly warmed up.

5.—Use best grade of gasoline obtainable, especially in cold weather.

**Lubrication of Transmission.**—Like other units the transmission needs to be well lubricated. However, too much lubricant should not be put in at any one time. If the countershaft is nicely covered with grease the entire transmission will be thoroughly lubricated, while if too much grease is put in there might be danger of its working through the bearing caps past the felt washers. A good grade of lubricant should be used and of proper consistency such as 600W or equal.

Adjustments to the transmission, after they are placed in a truck, are not necessary, and should not be attempted unless by accident something has happened.

Whenever the inspection plates or covers are removed from the transmission, great care should be taken to see that no grit or foreign matter is allowed to enter, as it is such material that cuts the bearings and makes rough working surfaces which produce undue wear and tend to ruin the mechanism through no fault of the transmission.

If the truck driver will see that the transmission at all times is held firmly in place in the truck, and that all supporting bolts and brackets are tight, and that a good clean grade of oil is used in the transmission, it may be entirely forgotten and still perform its duty in an unfailing manner.

The transmission grease should be cleaned out at least twice a year, and the gear box washed inside by running benzine or gasoline through it, after which it should be again filled with clean oil.

If these very simple instructions are carried out, the transmission will perform its gruelling services for years and years without attention of any kind.

**The Carburetor.**—There is not any part of the automobile engine that has more material effect upon its efficiency than the carburetor, which supplies the explosive gas to the cylinders. It is only in recent years that engineers have realized the importance of using carburetors that are efficient and that are so strongly made that there will be little liability of derangement. As the power obtained from gas engines depends upon the combustion of fuel in cylinders, it is evident that if the gas supplied does not have the proper proportion of elements to insure complete and rapid combustion the efficiency of the engine will be low. If the gasoline mixture is not properly proportioned the rate and degree of burning will vary, and if the mixture is too rich or too weak the power of the explosion is reduced and the amount of the power applied to the piston reduced proportionately. In determining the proper proportions of gasoline and air one must take the chemical composition of gasoline into consideration.

The ordinary gasoline used for fuel is composed of about eighty per cent carbon and sixteen per cent hydrogen. Air is composed of oxygen and nitrogen and the former has a great affinity or combining power with the constituents of hydrocarbon fuels; therefore what we call an explosion is merely an indication that oxygen from the air has combined with the carbon and hydrogen of the gasoline.

While it is apparent that the chief function of the carburetor is to mix the hydrocarbon vapor with air to produce an explosive mixture, modern carburetors are called upon to supply certain quantities of gas of proper proportions at all engine speeds. The engine should run from its lowest to its highest speed without any irregularity of torque, the acceleration should be gradual rather than spasmodic, and this is controlled by regulating the supply of gas to it.

The importance of this problem of carburation from an economic standpoint can be seen from the results of a recent investigation that showed that 25 per cent of the gasoline used in motor vehicles at present is passing through the motors unburned. Norman J. Smith, superintendent of garages and trucks, Consumers Company, Chicago, says the saving realized on gasoline by keeping their trucks running as efficiently as possible is shown by the following figures: During July, 1921, the fleet ran 107,306 miles at a rate of gasoline consumption of 2.96 miles per gallon. One year ago, July, 1920, the average miles per gallon was 2.32. By increasing the mileage per gallon from this figure to the present one of 2.96, a saving of 10,116 gallons of gasoline was effected, which at the present price of gasoline was approximately \$1,426.

By the installation of gasoline storage tanks with a capacity of 21,000 gallons they are now enabled to buy gasoline in tank car lots which in July saved them about \$.04 per gallon. As 36,134 gallons were used during the month of July, they saved \$1,445, making a total of \$2,871 saved on gasoline alone for the month.

**Wasting Gasoline.**—It is a well known fact that a gasoline engine operates with higher efficiency with what is known as the lean mixture or approximately fourteen parts of air to one of gasoline. Many wasteful engines run with an eight to one or rich mixture, which, of course, not only wastes gasoline, but causes the cylinders to carbonize rapidly. This latter mixture takes the "pep" out of the engine besides. These wastes are all traceable directly to the carburetor, but the adjustment of this "heart" of the engine cannot alone solve the problem. Unless the cylinder gets a large, hot spark, all of the mixture from the carburetor is not consumed. The ignition requires considerable attention on this account. All connections and cables should be kept clean and properly insulated.

Direct leakage in the gas tank and gas lines are tremendous wasters and it is wise to look at these points occasionally.

It is an acknowledged fact that every waste of power is a waste of gasoline and for this reason the entire fuel system requires cleaning at regular intervals as the filters and screens, placed to catch dirt, very quickly clog up.

Working again on the power waste theory, attention is directed to the muffler, which, if not kept clean, will accumulate carbon, retarding the exhaust gases and robbing the engine of considerable power.

Poorly seated valves permit leakage and should have their share of attention along with the cleaning of carbon from the cylinders at regular intervals.

Twenty-five per cent of the gas mixes with the air that circulates over the engine, therefore never race the motor or allow it to run idle, especially trucks that are equipped with an up-to-date starting device.

Drivers should not allow their trucks to eject black smoke through the muffler, because at the best of times twenty-five per cent of the gas used is ejected in black smoke.

It is very important that the carburetor be properly adjusted and oil kept at a constant level, all cars and trucks being equipped with an oil gauge of some kind.

Keep the engine from overfeeding.

See that radiator is always filled with water. See that water pump and fan are working properly, as 40 per cent of the gasoline emerges from the radiator.

Only ten per cent of gasoline drives the truck over the road. Manipulate the hand throttle when driving over rough roads; both feet are required to operate clutch and brakes; coast whenever possible. Every little helps to lessen the cost of operation of car or truck.

**Gasoline Specifications.**—The Bureau of Mines at Washington has issued tentative specifications for the purchase of gasoline by the government and outlines its ideas as follows:

1. Neither the gasoline nor its products of combustion should have a strong or nakedly disagreeable odor, this being objectionable to users of motor cars.

2. Gasoline should be free from matter which is not hydrocarbon, such as water, sediment, acid and so on.

3. The gasoline should be free from bodies which either originally or after combustion attack the metal composing the engine. Acid unremoved in refining and excessive sulphur content fall under this head.

4. The gasoline should not contain excessive percentages

of unsaturated or aromatic hydrocarbons, since some evidence is at hand to indicate that there may be limits in the ability of motors as at present constructed to utilize these products.

5. The gasoline should not contain too high a percentage of very volatile products which tend toward high evaporation losses and excessive danger in handling and storage.

6. The gasoline should not contain any considerable percentages of heavy or non-volatile constituents which prevent the atomization into engine cylinders of a mixture which can be burned completely.

The specific gravity test has been eliminated in the tentative specifications. It is generally considered that specific gravity alone means little, since it may give a high rating to a poor gasoline and a low rating to a good one.

**What Causes Motor Knock?**—Norman J. Smith, Consumers Company, Chicago, says there is more misinformation current among the automobile owners and truck drivers regarding this quite common ailment than of all other motor ills combined.

The carbon knock is recognized by a regular succession of distinct, almost metallic sounds as of blows on an anvil, is one of the most important knocks that affect the gasoline engine.

Carbon accumulates upon the piston heads, the upper portions of the cylinder, also about the valves of the motor. This accumulation is due to a too liberal use of oil of poor grade and to incomplete combustion of gas.

Should this carbon cause your motor to knock and you were to ask the average driver for the cause of this you would get all sorts of answers. A great many tell you that the carbon becomes so thick that the piston, on its upward stroke, strikes the cylinder head. This is not true. When you consider, however, that the series of explosions going on continuously in each cylinder brings the carbon covering the inner walls of the combustion chamber to a red heat you have the answer to this question.

As the piston compresses the fresh mixture of gas and air, the hot carbon acting like a spark from the ignition system fires the charge before the point of maximum compression is reached; only the momentum of the fly wheel carries the piston over and prevents it from being driven back downward.



The shock resulting from this premature explosion is heard as a distinct knock and it will be at once seen that the decided loss of power is due to the momentary tendency to drive the piston backward.

This knock is more noticeable when the car is on a hill or the engine is pulling hard. This is because at these times a richer mixture is being fed into the cylinders and the momentum of the fly wheel is less. Such a mixture is more easily fired and the diminished momentum makes it less easy to carry the piston by the dead center point.

On a level smooth road where the engine is not working hard, the explosions from the red-hot carbon and from the spark tend to come at the proper point in cycle and there is no knock.

This also explains why your motor does not knock when it is cold, even on a hill, and you wonder where it has gone. It is at once apparent, however, that until the engine has had time to heat up the layer of carbon it is not hot enough to ignite the gases. There is only one remedy that is really effective, and that is to remove the cylinder head, scrape or burn the carbon; after this is done rub with a fine piece of emery cloth. It is usually necessary to grind the valves at the same time. So-called carbon removers will give only temporary relief and when an engine is badly carboned they will not do that.

A clean motor runs like a charm and does its work with much more ease; giving the maximum power with the minimum gas.

**Driving Chains.**—The care and lubrication of driving chains increases their efficiency and reduces maintenance cost. Many chains have been allowed to run for an entire season, or until actually worn out, without inspection, lubrication or any attention whatever. Some drivers who are otherwise careful in the attention they give to the working parts of their vehicle are negligent in respect to the chain equipment. If a chain is allowed to run dry lasting damage is often caused.

To obtain best results chains must be carefully inspected, repaired if necessary, and lubricated often. Sprockets should at all times be kept in perfect alignment. When sprockets are so badly worn that the teeth are hook shaped they cause the chain to snap and whip, which imposes undue strain. When sprockets

are in this condition they may be changed about and the opposite sides of the teeth are used. Chains should be neither too tight nor too loose for best results. If you think your sprockets are badly worn report same to office. Do not attempt to use a new chain on an old or much worn sprocket.

To lubricate a chain well, Thuban compound should be applied with a brush. This should be done in the morning before the truck leaves the garage. The trucks having been washed during the night, the chains are clean and results obtained are far more satisfactory than if the chain were dirty.

Each part of the chain should be inspected after cleaning and before lubricating, and any part which is in poor condition should be removed and replaced. Replacement of parts should be made whenever it is found that one part is badly worn or when a bushing or rivet has become loose in the side plate from some unusual strain. If badly worn parts are allowed to run for any length of time they will eventually ruin the entire chain. Keeping the chain in repair will greatly prolong the life of both chain and sprockets.

The shortening, lengthening or repairing of a drive chain is not a difficult matter, as the chain can easily be separated at each link, and parts removed or inserted without the use of any special kind of tool.

Care should be exercised in handling a truck around piles of crushed stone, gravel and sand, as these materials, if wedged in between the chain and sprocket, may lock the wheels and a sudden strain in pulling out often results in breaking the chain and always places an undue strain which shortens its life.

This fact is born out in the records of the trucks working on various materials.

The chains on trucks hauling sand, gravel and crushed stone have considerably less life than those engaged in transporting coal and ice.

Another point to remember in preserving the life of chains is carefully applying of brakes. In applying brakes too suddenly, the weight of the truck is thrown entirely on the chain through its momentum. A sudden start will cause a similar strain, so that care in stopping and starting should be exercised at all times.

**Selecting Tire Equipment.**—How to get the most out of

tire equipment, whether it is most advantageous to use solids or pneumatics and how to care for tires are questions which are daily confronting a great many truck owners.

In determining whether to use solids or pneumatics there are a number of fundamental facts to consider. S. V. Norton, in *Acme Angles*, furnishes some very interesting information on this point.

"The field of each type of tire," says Mr. Norton, "may be separated into three classifications within which the operator may reasonably place his installation and select his equipment accordingly. These may be called: (1) The imperative field; (2) the economic field, and (3) the optional field.

"The factors that would bring a truck within the 'imperative' field for solid tires are: Reasonable road surface, dependability of delivery, regularity of delivery, and heavy loads with frequent overloads.

"If delivery must positively reach its destination without fail at time promised; if regular delivery is a more important factor than either speed or cost of delivery, or if it carries overloads beyond the rated capacity of the tires, solid tires should be used.

"Similarly, the factors that would bring a truck within the 'imperative' field for pneumatics are some combination of the following: Traction on any kind of road surface, or off the road, with cost subordinated; speed with cost subordinated, or protection of merchandise from road shocks.

"The factors that would bring a truck within the 'economic' field for solid tires are: Short hauls in cities where speed is relatively unimportant; heavy loads with tendency to overload; traffic congestion, which reduces average speed; loading and unloading delays and need for low delivery cost.

"Similarly those that would bring the truck within the 'economic' field for pneumatic tires are: Road conditions which will not prematurely destroy the tires; long hauls; high average speed; relatively light loads with no overloads; tire service conditions good and low cost subordinated to quick service."

By analyzing according to the above classification the conditions under which his truck operates or will operate, a truck user or prospective owner should be able to determine fairly accurately which tire equipment is most serviceable for his truck, pneumatics or solids.

**Causes of Tire Waste.**—There are three fundamental causes of tire waste, although many contribute to lessen its life: Careless driving, overloading and speed.

Careless driving is really the result of speeding, but both are such heavy contributors that they must be considered separately. The careless driver, not appreciating the value of his charge, is too apt to apply brakes so that they "grab" and cause the skid. This is very disastrous. Even railroad and traction companies have had to give this very careful study. The flat wheel to the railroad is the skinned tire of the road transport vehicle. Turning corners too rapidly should be avoided. This not only causes skidding, but bestows an extra strain on the outside of the tire which rapidly breaks down the wave in the tread rubber and kills its resiliency. Take a rubber band and outstretch it sufficiently to kill its "snap back" and you have the same condition as in the tire which is abused by swinging a strain around corners and skidding by grabbing brakes. When a heavily loaded truck swings a corner the driver knows how the weight immediately shifts if the corner is taken at too great a speed, and although the entire truck suffers this strain, the tire is the under dog and bears the brunt of the damage.

Remember that the rapid distortion and flexure of the tread rubber creates heat which impairs the strength and life of the rubber. This excessive heat makes the rubber brittle, especially in solid tires.

Chains are a help when needed, but should be removed as quickly as the necessity for them has passed. It does not take many feet of travel on a chain to cut through the tire with a heavy duty truck on city pavements. The pavement suffers, too, but the big damage is to the tire.

Bad roads cause excessive small shocks to the tire which bear a similar relation to speed in causing distortion and flexure of the tread rubber, and as a result the tire becomes brittle with no "snap back."

In reply to a number of questions relating to the operation of solid tires, the B. F. Goodrich Rubber Company has given an exhaustive reply, the main points of which are given herewith. The points emphasized are well worth considering and if brought to the attention of the truck driver are sure to result in the saving of many dollars.

Of all possible abuses to solid motor truck tires, overloading is the most disastrous.

Truck owners should make sure that their truck is equipped with tires sufficiently large to take care of the greatest load the truck will be subjected to. There is only one way to determine the actual weight of a truck, and that is to run it on scales, both with and without load, and to find out, not only the weight, but also the weight carried on each axle.

Trucks are frequently loaded so that the bulk is piled near the tailboard and in such cases the rear tires are usually found to be carrying an overload, although the total load is well within the truck's capacity. Thus when the truck is in motion a crushing leverage is exerted which is ruinous to the tires. There is only one solution to the overload problem and that is the "ounce of prevention."

Because a tire is solid many people believe it escapes one of the destroyers of the pneumatic tire—namely, heat. Yet heat is as disastrous to solid tires as it is to inflated tires.

Heat makes its appearance in overspeeding. When a pilot sends his truck, loaded or unloaded, pell-mell over a smooth or rough road the heat that is generated within the tires, due to rapid displacement and road friction, is serious enough to cause a permanent injury.

More or less severe cuts in solid tires are of common occurrence. The ultimate effect of a cut depends on its size and location. The tendency of cuts near the edge of the tire is to enlarge, especially in a circumferential direction. Some trucks are backed up a great deal and the damage consequently spreads both ways from the injury. If cuts are not properly trimmed the torn rubber or "flag" catches as the wheel revolves and so enlarges. Neglected cuts have often developed to such an extent that they have caught in frogs of car tracks and torn off practically the whole tread.

To prevent the continuation of a cut on the edge of a tire bevel it off with a sharp knife.

Skidding, or locking the brakes and sliding the wheels, results in serious and uncalled for damage. This has a ruinous effect on the mechanism of the truck, and causes as well, irreparable damage to the treads of the tires. It subjects the tires to

an unusual strain in addition to the work which they must perform in supporting and propelling the truck and its load.

Drivers should be brought to realize that their trucks will stop quicker if brakes are applied gradually and firmly rather than sharply. Improperly adjusted brakes will sometimes cause one wheel to lock, which grinds or tears off a section of the tire.

As soon as a truck starts to skid it should be steered, if possible, in the direction of the skid. Drivers should be admonished against the rapid turning of corners. This increases the strain and wear on tires with the same ultimate effect as skidding and sliding.

Injuries resulting from running solid tires in car tracks are serious and readily apparent. Their construction does not permit of ready distribution of a part of the load to the lower flange of the rail, so the major part of the load is carried upon the upper section of the car rail. This throws the entire load on one-half of the tire tread with the result that it is quickly worn or broken away at that side, eventually leaving the tire, reduced by one-half, to carry the full load.

Injury from car track riding is not confined to one or a few spots on the tire, but the rubber is worn down in a line following the entire circumference of the tire.

Loose chains on solid tires have been found least injurious, as they work themselves around the wheel and provide an equal distribution of the wear and strains.

It is advisable to use a device having cross pieces, as the wheel gains momentum between these points, and the greater the distance the more severe the blow. Less injury will result if such devices are used only temporarily to pass over soft, slippery places. Great injury results from careless and continued use of anti-skid devices on pavements or hard roads where there is little or no need for them.

The running of wheels out of alignment will quickly grind down a solid tire.

The effect of the tread is caused by the continuous friction of the tire being partly dragged and partly rolled over the roadway. It can easily be detected, as it grinds the tire off smoothly and leaves sharp corners.

**Maximum Amount of Wear.**—In most instances a solid

rubber tire has outlived its usefulness when the rubber is worn down to a point about one inch above the edge of the steel base. This maximum amount of wear is very clearly indicated by the flattening of the tire in different places on the circumference, which produces the same effect on the truck as is caused on a freight car when it has a flat wheel. It frequently pays to remove tires while they still have about one inch of rubber above the edge of the tire base. The practice of many owners in keeping the tires on the wheels until the base separation occurs or the soft rubber is worn off is a most expensive economy, as the increased vibration often produces broken front axles and steering knuckles. The cost of making such repairs is far in excess of the sum saved by running the tires a few hundred miles more.

Flat tires may be caused by imperfections in the tires themselves or by improper care on the part of the truck driver. In the latter instance a too sudden application of the brakes most often produces flats, since the rear wheels become locked and slide along the surface of the pavement without revolving in the ordinary manner. This causes an excessive friction at the point of the tire in contact with the ground, with the result that the tire at that point is worn slightly out of round.

Base separation when the tire is not defective may be caused by changing the direction of the truck motion too suddenly while it is traveling at a good rate of speed. Turning the front wheels to a cramped position to get away from the curb while the truck is standing still also produces an excessive side thrust that tends to tear the soft tread rubber away from the hard rubber base.

**Cold Weather Hard on Tires.**—Winter-time is a hard period for automobile tires. Because of changing temperatures, standing in the freezing cold part of the time and kept in a warm garage at others, even tiny cuts in the tread are more apt to develop into big holes than in summer. Particles of ice and snow will lodge in the little cuts, and when the car is put in a warmer place, this ice will thaw, wetting the fabric and leading to a gradual disintegration of fabric and tread. When the moisture again freezes, it serves to do further damage.

It is best to fill up all cuts with tire dough, keeping out water as much as possible. There are several excellent preparations in the market to heal tread cuts.

**Removing Big Pneumatics One-Man Job.**—The apparent ease and dispatch with which a thoroughly experienced driver can dismount and apply without assistance big pneumatic truck tires is evidence that there is a knack to it that is worth the attention of those who own or operate trucks.

In the following paragraphs, the United States Tire Co. points out briefly how handling these tires can be made a one-man job.

To dismount the tire and rim from the wheel, jack up the wheel until the tire freely clears the ground, loosen the tire bolts, and then the rim by shock, and turn the wheel so that the sector containing the valve is near the ground. With both hands grasp the tire and rim at points just below the level of the hub, and quickly lift and pull the rim away from the top of the wheel. At the same time watch the valve to make sure that it does not bind in the felloe, when the rim slides off the felloe band.

If properly performed this method of dismounting the tire and rim from the wheel requires very little lifting, and causes no damage to the valve or the tube at the valve base.

To detach the tire from the rim, lay the tire on level ground, locking ring side up, remove the valve plunger to complete deflation, and push back the valve stem inside the rim. Remove locking and side rings, loosen the flap all around and, standing inside of the rim, lift the tire straight up off the rim.

When the tire is ready for replacement on the rim, reverse the operation of detaching the tire from the rim with tube flap in place and valve stem pushed back flush with base of flap, drop the tire carefully over the rim, taking care that the base of valve stem is directly opposite the rim valve hole. Step down the tire on the rim all around by treading on the bead, apply side and locking rings, draw out valve stem to proper position and inflate.

Finally, in applying the rim and tire to the wheel, engage the valve stem in the felloe at a point level with the hub, push the rim firmly against the felloe and slowly turn the tire, rim and wheel until the valve is at the highest possible point. The rim will drop into place on the felloe except at the bottom, where it can be pushed on by the foot.

This knack of first engaging the valve, then turning the tire



and rim on the wheel, eliminates all direct lifting and makes the applying of large size pneumatic truck tires a one-man job.

When a rim with tire is mounted on the wheel, it often happens that the rim cannot be moved into place, remaining partly on and partly off. Slight springing of the rim is all that is needed, and this may be done by placing the head of a jack against the hub of the wheel, and the base of the jack on the protuding portion of the rim. Thus sprung a little, a hammer blow will slide the rim over the edge of the wheel. In most cases of this kind, the mere operation of the jack will force the rim over the wheel.

**Advertising Value of Trucks.**—Do not overlook the advertising value of a well-painted truck with your business name and address where everybody can see it. It is a money-saving and business proposition.

When painting the truck body, don't try to save on the paint. Rather use too much than too little. At least three coats should be applied and covered finally with a top coat of finishing varnish that is impervious to moisture.

Part of the value of a motor truck lies in its advertising the fact that the owner is a progressive business man, keeping up with the times. But to cash in on this advertising value a truck must be well painted and have the owner's name in a conspicuous place. Department stores, florists, dyers, and cleaners, as a rule, watch this very carefully. Their light delivery trucks are generally attractively painted, with the result that they create in the public mind a most favorable impression. The single-truck owner as a rule overlooks this. He seems to figure that the truck operates just as well without a coat of paint as with one, and consequently lets the painting go until the truck's appearance reflects upon his business methods. A dirty-looking vehicle cannot inspire confidence in the owner's business.

On the other hand, the owner whose trucks are kept properly painted not only attracts business, but creates for the owner a favorable impression among the business men and bankers. It is a matter of fact that bankers will customarily loan more money to clients who care for their property than to men who allow them to show signs of neglect.

When a truck comes from the factory it is well protected

with paint and varnish. This coating soon begins to show signs of wear. Not because the materials used are of inferior quality, but as a direct result of severe service and indifferent care.

Every truck owner who reads this should consider the importance of having his truck or trucks refinished with a protective and attractive coat of paint. It is a business-saving and business-building proposition pure and simple. A well-painted truck adds to the owner's credit, both on his ledger and in public esteem.

In the long run, it is cheaper to paint than not to paint. A protecting coat of paint conserves the body, cab, and exposed portions of the truck.

**Cleanliness Important in Truck Life.**—Cleanliness is important in everything, and particularly so in connection with motor trucks, not only for the sake of appearance, but in lengthening the life of the truck. Norman J. Smith, superintendent of trucks and garages, Consumers Co., Chicago, in an article "Personal Appearance in Truck Life," published in the company's house organ, "The Seal," says that "Just because the engine, for instance, reposes under the hood safe from the gaze of the casual observer as the truck speeds along the highway, is no reason why the pride of good appearance should not extend to the internal workings of the machine. It is even more important to keep clean such an important factor of a truck as the engine than it is to be able to see through the windshield. The engine should be kept so clean it will be perfectly at home when being driven through any part of the city. It should be kept free from oil, grease, dust and corrosion of iron and brass. The cleaner it is, the longer it will run satisfactorily both as to fewness of troubles and length of life.

"Personal uncleanness is supposed to tend toward ungodliness, just as sure as engine uncleanness is certain to tend to breakdowns and wornout motors. One may well err on the side of cleanliness in preference to slovenliness. The motor ought to be cleaned off on the outside after any run when roads are dusty, or after a dusty load.

"One may be as particular as possible, yet there will be some oil or grease on the motor exterior. Probably that which lodges upon the cylinders will, if there be much hill climbing to heat the motor unduly, make itself both visible and smellable—visible in

a thin streak of smoke coming from the hood, smellable to the point of offensiveness when that streak of smoke strikes the olfactory nerves. But in most instances it will remain upon the engine, gradually becoming a gum from the drying up of the substance and the accretion of dust from the road. The longer it remains the harder it is to remove it; hence, when the work is done in the garage every time when the truck comes in, it will take but a few minutes and slight labor. If allowed to accumulate, it may mean hours of work to get rid of the hard deposit.

"Begin at the top of the engine. First see that all the wire terminals at the spark plugs are free from corrosion and grease. They should be dry and clean, if they are to transmit the current to the plugs. Usually the wires are carried in a tube to protect them from heat and grease. In any event, trace the wires to see that oil or grease is not present upon them. Either will rot the rubber insulation and cause a leak which will affect the ignition. Examine all the terminals under the hood for the same purpose and every once in a while disconnect the wires, one by one, and scrape the terminals bright; also the contact point where the terminal is fastened. Replace the wires one by one as they are cleaned so they will not become disarranged. See also that there is no oil, grease or dirt on the spark plugs, for it might form a path for the current to practically short circuit the plug.

"Wipe off the top of the cylinders and blow out accumulations of dust from any recesses where it has collected. If there is thickened or gummy oil upon the metal which will not wipe off readily, saturate the waste or cloth in gasoline at the carburetor drip cock and it will loosen up quickly. Gasoline is more convenient but kerosene will do the work better, leaving a surface less likely to rust.

"In the same way clean the exterior of all parts of the motor and everything attached to it. Bright iron parts may be kept from rusting by wiping them with a rag dampened by a thin oil, which should be wiped off regularly.

"The fan, fan belt, pulleys, gear casings and other parts at the front end of the truck collect much dust and should be kept clean. The air holes through the radiator must also be kept free of dust, oil and asphalt from oiled roads. In fact, every part under the hood needs frequent cleaning.

"Where mud and asphalt are dried and refractory, it may be necessary to use kerosene. Grease and oil will also yield to kerosene. The kerosene, however, should be wiped off and the painted parts polished with a cloth dampened in linseed oil. Naturally, this should be removed completely, so that the surface will not catch dust. Do not use soap on the highly polished surfaces of the body.

"There are some parts of the chassis and undergear which will not be readily reached by the hose and water when cleansing the body. They should be rubbed off and cleaned of dirt of all kinds. The parts of the various rods and rocker shafts, particularly near the bearings, should be kept clean.

"There are a number of details involved in keeping up the appearance of a truck, but attention to these details, even though they take a little time, in the long run will save the owner considerable expense and add immeasurably earning power."

**Motor Trucks a Fire Hazard.**—Every truck driver may have to cope with fire at some time or other, so it is best to be prepared. Everyday handling of the truck tends to make the driver indifferent to the hazard of fire, and the latter, when it does happen, is very sudden and without warning.

All possible steps should be taken by the truck owner to prevent fires. A fire extinguisher carried on every truck is not alone a protection but it cuts insurance. One or more extra extinguishers in the garage is also good business for if the fire takes place in the garage every machine will be endangered.

The following ordinary precautions should be followed by every driver:

Do not let oily rags or waste lie around the garage. Keep them in a metal container and sweep the floor often. This prevents the spread of fire.

Keep the engine clean, especially the pan. See that there is a small hole in it under the carburetor drip; if there is none, make one.

Never fill the gasoline tank near an open flame. Likewise, see that the funnel used makes metallic contact with the tank; it has happened that static electricity generated by the gasoline flowing through the funnel has sparked the tank and caused a serious explosion.

Make sure that the tank does not leak, particularly when it is located under the cowl. Go over all gasoline connections to detect any leaks.

If not already convenient, install a gasoline shut-off where it can be reached readily. Always shut off the gasoline when leaving the car in the garage. A strainer should also be installed in the feed pipe if there is none on the car; and sediment should be removed once a month.

The entire electric system must be watched and the connections kept tight. A loose or grounded wire may start a fire. When cleaning the engine with a brush use one with no metal parts; a short circuit caused by the metal on the brush may ignite the gasoline used in cleaning.

Should a fire start in the carburetor, shut off the gasoline and start the engine, as racing it will soon draw all the gasoline from the carburetor. Sand can be thrown at the base of the flame, and when using the extinguisher, squirt it through the radiator without raising the hood.

**Overspeeding of Motor Trucks.**—Overspeeding of motor trucks is not only dangerous, but, like overloading, is a factor which greatly lessens the normal life of the truck. This is an observation by an authority and is worthy of serious consideration. Most trucks are equipped with governors to prevent excessive driving speeds. It is just as essential to keep down the speed in coasting.

A heavy truck in motion represents a tremendous amount of energy whose destructiveness increases at a much greater ratio than the increase in speed. It therefore requires much more effort to control and it can do untold damage should it get beyond the driver's control.

Excessive speed causes excessive wear. The driving shafts are designed to run at certain speeds below their critical or bending speeds. Whipping of drive shafts does not tend to increase gradually but is almost instantaneous in its action once the critical speed is reached. Much damage not only to itself but to surrounding parts may be the result of a shaft whipping out of its proper position. The engine flywheel and clutch parts may also be damaged beyond repair should they run at an excessive speed.

Truck tires, particularly the usual solid type, are rapidly

destroyed by abnormal speeds. It is here that the cost of over-speeding is most quickly felt by the truck owner.

**Overheating of Truck Motors.**—In some territories heating of engines is often caused by accumulation of lime, iron or other impurities in the water jackets of the engines. These impurities stick to the outside of the cylinder walls just the same as scale sticks to a boiler. The scale on the cylinder acts as an insulating wall and results in overheated engine.

In order to remove this scale it is recommended that the cooling system be drained and thoroughly flushed with water, then the lower pump connections plugged up and the water jacket (not the radiator) filled with a solution of one part of hydrochloric (muriatic) acid of a specific gravity of 1.20 and three parts of water, by volume. This solution may be left in the water jackets until the scale has been loosened, and, in fact, the solution may be made a little stronger at the last.

After the scale is loosened the water jacket should be flushed with pure water by means of a hose for several minutes.

It is necessary that the acid be thoroughly removed after cleaning to avoid permanent action on the cylinder walls.

This solution should not be used in the radiators, as it will attack any impurities present in the copper.

**Bearing Adjustments.**—The life of a motor depends largely upon its bearings. One ruined bearing will soon cause the wreck of the entire motor. And yet some drivers, knowing this fact, will continue to drive a motor with a loose bearing until it finally burns or hammers out, or a connecting rod crashes through the side of the crank case, so forcibly reminding them that repairs are necessary.

A loose bearing will produce a distinct knock in the motor. Sometimes it is necessary only to tighten the bolts which retain the bearing caps in place, and again, in case of a badly worn bearing, it may be necessary to remove one or more of the liners or shims placed between the cap and the upper half of the bearings so that when the cap is pulled up snugly the journal will show the proper contact on the bearing surface.

Unless you are experienced in adjusting bearings, do not attempt it yourself. It is a simple procedure to the initiated, but difficult to the novice.

Better to place your truck in the hands of experts and know that all is well.

**Fouling of Spark Plugs.**—When spark plugs habitually become fouled with oil and soot it is a good plan to investigate and see whether they may not be projecting too far into the combustion chamber, particularly when they are located in either one or the other of the valve pockets. If they are screwed into the valve port caps, the removal of the caps with the plugs in them will be the best way to determine the condition. The points of the outer end of the shell should extend very little beyond the inner faces of the valve caps. Anyway, the adjustments to the carburetor or lubricating system should be made to prevent excessive gas or oil feed.

**Weak Valve Springs.**—Weakening of the springs which close the valves is a common cause of faulty engine operation. Whenever the valves are taken out the springs should be examined to see that they are all of the same length, or rather that all of the inlet set are of the same length and all of the exhaust, as the exhaust springs will probably be a little longer than the others. If one spring is shorter than the others in its set it should be stretched, or else a metal plate be put under it to bring tension up to equality with its fellows.

**Courtesy of the Road.**—Hogging the road on country highways is apt to put some other truck in the ditch, and inadequate headlights on motor trucks on country trips, at night, are the cause of many an accident. Railroad crossings should be carefully scrutinized before being crossed. It is better to stop, get off, and make certain, than to take any chances. The driver who persists in taking chances on railroad crossings sooner or later will come to grief. Overloaded trucks on highways are also a source of danger. Don't overload or overspeed. Help conserve life, limb, and property. As the old saying goes: "It's better to be late to work, than early to Heaven." Keep cautioning your drivers. It pays.

**Danger From Exhaust Gases.**—The carbon monoxide gas from your engine exhaust poisons the air in a closed garage.

Never run your engine in a closed garage. The exhaust

gases are poisonous and often fatal. You may be overcome suddenly and never regain consciousness.

If you must run your engine in the garage leave all the doors and windows open and have the rear of the car close to the main door.

Carbon monoxide is without color or odor. It acts quickly and without warning and an engine running under normal conditions (even with the garage doors and windows open to a slight extent) often generates this gas in a dangerous quantity.

The first symptom is dizziness, and this may be followed almost at once by unconsciousness. The victim should strive to reach fresh air before he is wholly overcome. Hot stimulants and external applications of heat will assist him to recover. The important point, as far as immediate action is concerned, is to get out of the poisonous air and into the fresh air as quickly as possible. The services of a skilled physician should be obtained.

**Miscellaneous.**—The most severe strain that can be placed on rear axle or driving gear is to try to get out of a mud hole by backing up a little and then plunging forward on low gear.

Spark plugs should never be forced into position by severe wrench action. They should seat firmly against a copper asbestos gasket with but little more force than can be applied with the fingers.

Anti-skid devices are intended for soft dirt or snow and if used, when the wheels cut through to the hard road, should be removed. Otherwise they will ruin the tires, also cause great damage to the truck.

In fitting a spark plug in a cold cylinder be very careful not to screw it too tight. The principal cause of the breakage of the porcelain insulators is the expansion of metal when the engines get hot, thereby exerting a crushing effect on the plug and resulting in a cracked insulator.

Correct size, style, quality and general suitability of the tire equipment are quite as necessary to low cost of operation as selecting a truck of special design, speed and carrying capacity.

Some drivers, even after years at the wheel, have not learned to shift gears without causing clashing. If the engine is accel-



erated just slightly, that is the pedal barely touched for an instant while the shift is being made, the gears will usually mesh freely.

The wear and tear on the engine and the resulting loss of power due to a slipping clutch directs attention to this detail in the anti-waste campaign. Brakes which drag, and misaligned wheels not only lessen the life of tires, but naturally retard power and play their part in the wasting of the gasoline.

In fairness to yourself and to other users of the highways do not tamper with the governor on your truck and do not permit of driving beyond a rational speed if your truck is not so equipped.

**Specially Designed Bodies.**—There is no standard design for truck bodies. The character of them varies about as much

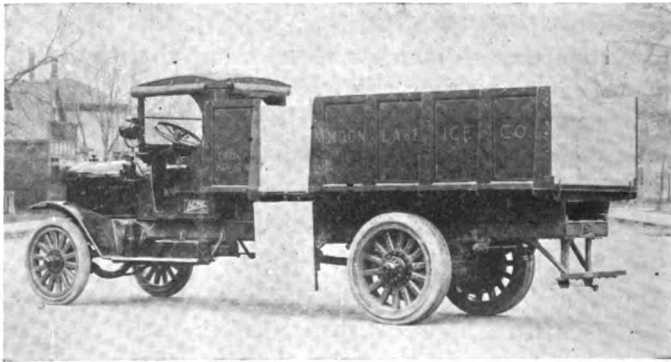


FIG. 58.—SPECIALLY DESIGNED TRUCK BODY

as types of wagons. However, the body is an important feature of a truck and consideration should be given to its construction.

The Moon Lake Ice Company, Grand Rapids, Mich., has adopted a special body (Fig. 58) for all of its Acme trucks, which was designed and built in the Acme factory after considerable investigation of the method of handling ice in large quantities had been made.

The body is composed of steel frame with steel ribs, wooden panels, with face of steel ribs where they intersect with wooden

panels covered with leather strapping. This prevents the ice from coming in contact with metal surface.

For convenience in unloading ice sections side opening is provided with pivoted door operated by spring control levers.

The frame of the body is built entirely of steel to supply the strength required. The five-inch rolled steel channels running full length of the body rest directly on the chassis side rail and support  $3\frac{1}{2} \times 3 \times \frac{3}{8}$ -inch angle-iron cross members at intervals of approximately two feet; these in turn are secured to the channel by means of angle clips, hot-riveted to both members. Steel posts bent from plate in such a manner as to give maximum strength are riveted to the cross members at either end.

All wood employed in the construction of the body is of the best quality oak, thoroughly kiln-dried and filled with linseed oil to prevent the absorption of moisture. The large panels comprising the sides and end of the body are  $\frac{7}{8}$ -inch thick and securely bolted to the steel posts with  $\frac{3}{8}$ -inch bolts. On the inside of the body opposite each post, flat bars are set into the wood in order to secure a firm seat for the bolts and to prevent them from loosening in the wood. The top and ends of the panels are ironed to prevent splitting and excessive wear when cakes of ice come in contact with them.

A large drop door is provided in each side of the body, equipped with a locking device to hold it in close position. The door is reinforced with steel bars on the outside which also act as hinges and is covered with sheet metal on the inside, making a very substantial and neat appearing construction. A foot-board 10 inches wide is provided on either side of the body, supported by angle clips riveted directly to the cross arm.

The floor is oak,  $1\frac{3}{4}$  inches thick, laid with openings of approximately  $\frac{1}{4}$ -inch between each board to allow for expansion and drainage. The floor boards are bolted to the angle-iron cross member at each support with two bolts in each board to prevent warping.

The rear of the body is equipped with a collapsible steel step, arranged in such a manner that it can be folded in flush with the end of the body when not in use. The spacing of the post and arrangement of the top rail, door and footboard is such as to form equal spaced panels, providing attractiveness and

pleasing appearance as well as unusual strength to the complete body assembly.

The Middletown Artificial Ice Company, Middletown, Ohio, has a special body made for its Kelly truck which has proven very satisfactory. A view of it is shown in Fig. 59.

Underneath this special truck bed a riveted, non-corroding pan, which slips in and out, was placed. At the rear of the pan

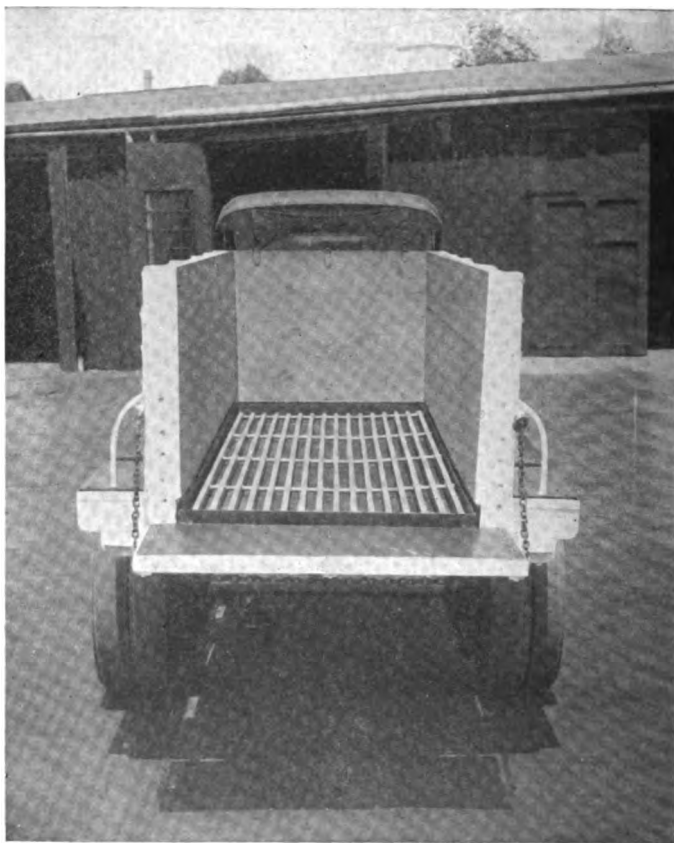
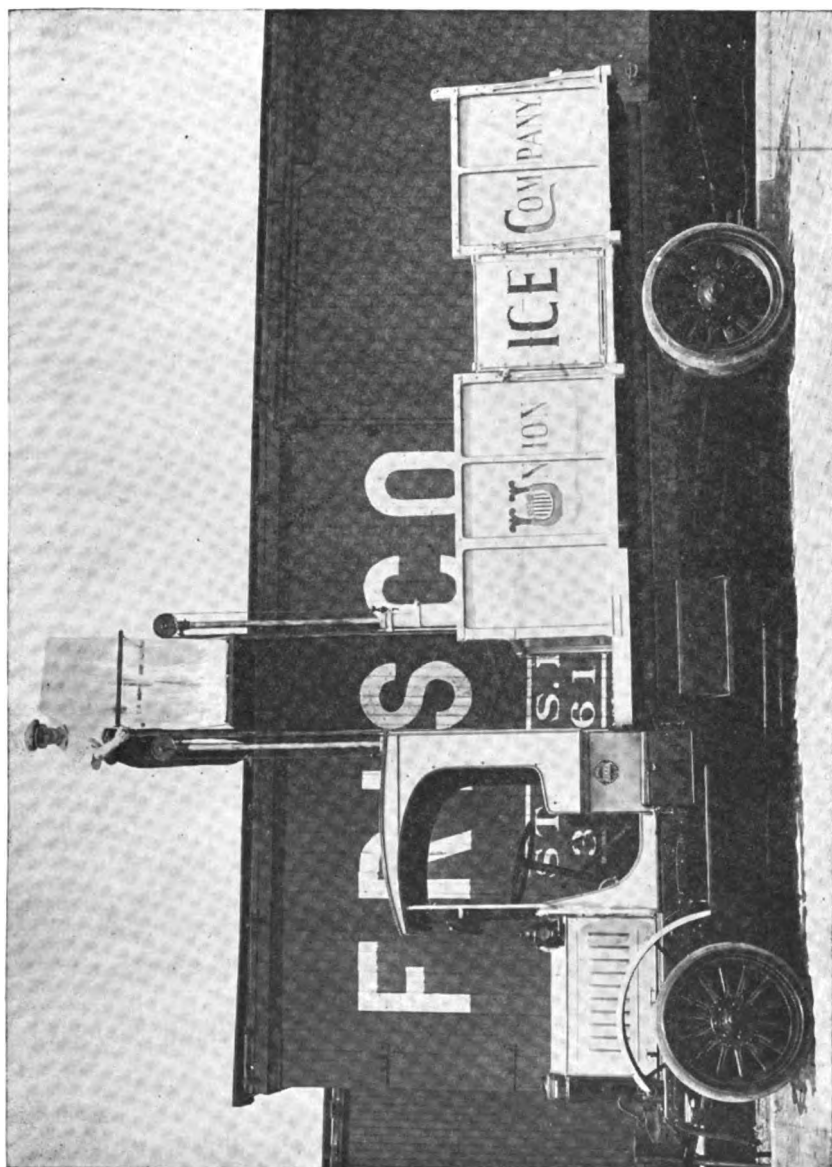


FIG. 59.—VIEW OF SPECIAL BED FOR ICE TRUCK

is a cock for letting out the drainage into the pan. This was done in order to prevent moisture from dripping into the machinery and causing deterioration.



MOTOR TRUCK WITH LABOR SAVING DEVICE FOR ICING REFRIGERATOR  
CARS, OWNED BY UNION ICE CO., PITTSBURGH, PA.

**Icing Refrigerator Cars From Trucks.**—How to ice refrigerator cars when there is no "icing station" nearby becomes a serious problem during the summer months, particularly when there are numerous traffic tie-ups or delays. Heretofore it has generally been solved by the application of human muscle power. The ice has been cut into sizes that could be handled and thrown from the wagon or truck to the roof of the car.

Now comes a device that is designed to save all of this labor. It is a special truck body, designed for the Union Ice Company, Pittsburgh, Pa., by John H. Stubbe, manager of the Locomobile Company's branch in that city and mounted on a Riker truck. In place of the strength of man's arms and backs there is a hydraulic oil elevator that will raise two 400-pound cakes to the car roof in one trip. The elevator, of course, is controlled from the truck and operated by its engine. It is flush with the right-hand side of the truck which allows of moving room for the operator who is below filling the elevator, and brings the ice to the very edge of the car roof, where the other operator drags it off with tongs. The entire four-ton load can be transferred to the interior of the refrigerator car in a few minutes with ten or fifteen round trips of the elevator.

The elevator is mounted on a structural steel base crosswise of the truck frame. The tubes and rams are made of the finest tubing combining strength with lightness. The oil reservoir contains a little less than the full capacity of the tubes, so that the tank is exhausted before there is any danger of injury to the rams. The cable passes under the cage and over two half pulleys to differentiate in case one ram should go up a little faster than the other. The body is designed so that it will carry a capacity load of about 9,000 pounds. When 300-pound cakes are carried the ice completely fills the body. This insures against breakage of cakes in transit. The complete weight of the elevator is 380 pounds.

Another type of body on a Packard chassis is shown in Fig. 60. It is entirely different from the preceding in that the entire body, with its contents, is raised to the top of the refrigerator car. This method greatly facilitates handling and permits other than full cakes to be used.

**The Electric Truck.**—Mr. C. A. Street, Chicago, says: "Superiority of the electric truck lies first in its simplicity, the motive power being nothing more or less than a new style of street car. The operating cost, including insurance, depreciation, maintenance and labor, is lower, also, and many large concerns were charging off their electric truck equipment in twice the number of years that they charge off their gas truck equipment. Where formerly difficulty with batteries was experienced these are now sold under a positive guarantee, while there are com-

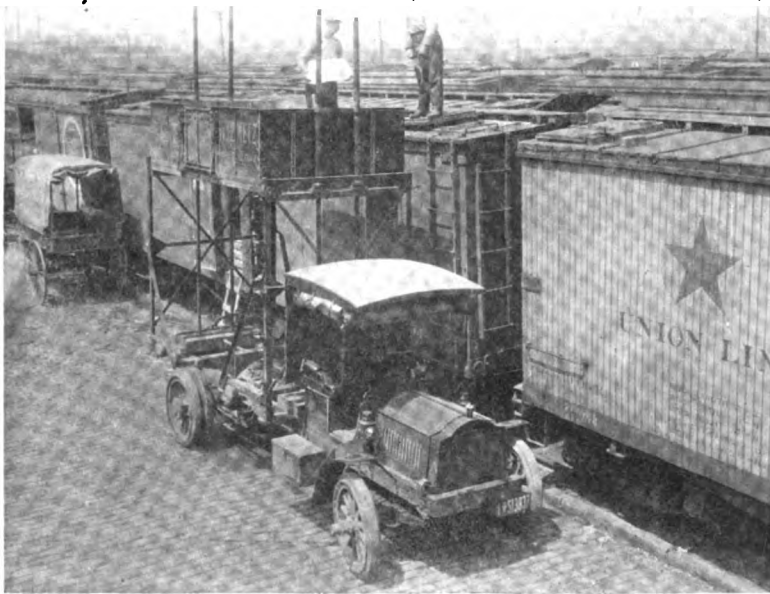


FIG. 60.—PACKARD TRUCK USED FOR ICING CARS

panies who will rent batteries at a given figure per month or per year, as they know the fixed cost or life of the batteries. An electric truck does not increase insurance on any buildings, and hence it is feasible to garage them at the loading platform. The labor cost is light. For instance, a mercantile house operated 239 trucks, and two good mechanics and four helpers looked after all of them. Regarding residence deliveries, one large ice manufacturer stated that on account of the comeliness and noiseless-

ness of electric trucks they were able to make deliveries at the back doors of many residences where neither horse nor gasoline trucks would be allowed to enter. Experienced drivers were not required with electric trucks, as they are practically fool-proof.

"The electric truck will probably average 20 per cent heavier than the gas truck, but they are operated at practically the same speed as the gas truck. As to injury from a sudden jolt, there is absolutely no danger, for the nickel-iron batteries used today could be thrown on the floor without injury. In a three-ton truck we install a motor of sixty volts and seventy amperes, or approximately six horsepower. That propels a three-ton truck eleven or twelve miles per hour. Tire manufacturers guaranteed gas truck tires for 7,000 miles in a year and electric truck tires 8,000 miles. The range of a five-ton truck on a single charge is about sixty miles on level country, but with the system of interchangeable batteries the truck can run twenty-four hours per day. It requires approximately six hours to fully recharge an average battery, but this can be boosted so as to do it in four or five hours. As to advantage of the electric truck for short hauls records of companies that had employed both gasoline and electric trucks show that for a short haul with many stops the electric truck is much more economical."

## CHAPTER XI

### CO-OPERATION—EMPLOYER, EMPLOYEE, CONSUMER.

**Establishing a Closer Relationship.**—The question of forming a closer relationship between employee and employer is one that has come about as a result of the evolution that has taken place in all forms of business.

Scientific study of the problems of production conducted for the purpose of obtaining 100 per cent efficiency from machinery and employees in order that the cost of production could be maintained at a point which would make it possible to market the output despite the ever-increasing rise in price paid for labor, has been the principal factor in bringing about a realization in the mind of the scientific investigator, and the employer as well, that some means should be found that would encourage a spirit of loyalty among workers to reduce the enormous labor turnover.

Increased earnings, due to the higher efficiency obtained, did not have any effect. Bonus systems were adopted; in most cases they have failed. Profit sharing has not proved much more successful. Money could not buy loyalty. Some other means had to be found.

Welfare work was the next step in the process. Many plans have been worked out. It was found that employees would respond better to efforts that had for their purpose better working and living conditions and a closer intimacy with their employers than anything else.



Recognition that the employer has an interest in his employee other than for just what he can get out of him as a result of his work, strikes a responsive chord in every man and brings out the best there is in him.

The methods by which the employer can impress upon his employees that he considers them human beings, and not merely productive agents for his own profit, are many. It must be done in such ways that the employee will not form the opinion that it is but another way to get more work out of him, which is so often the case.

A plan that has been followed with success in many cases is to inculcate into every employee that he is an actual component part of the organization; that the organization is nothing but one large family in which each has an individual interest; that his work and his actions as an individual reflect not upon the company, but upon every individual in it.

A man taking employment as a driver, even though he be inexperienced in the ways and tricks of the trade, does not associate with the other drivers for any great length of time before he gets from them the idea that the company considers him as bad as the rest, consequently, in most cases, he thinks he may as well have the gain as the name, and what he does not know about the game the other drivers are generally only too eager to tell him, and the natural result follows.

Drivers are human beings, with rights that must be respected. While the order of intelligence in the greater majority of them may not be very high, they have the right to expect just treatment, and they are of that class of men who, if it is proven to them that the company intends to give them a square deal and to have some consideration of their rights will, with few exceptions (and the exceptions are to be immediately removed) show their appreciation by giving to their employers the same treatment that is accorded them.

**Inspiring Loyalty.**—It is necessary to create a spirit of loyalty among employees to secure their interest and retain their services.

Loyalty to plan and purpose becomes one of the great vital principles of efficient living and doing. Viewed as the motor impulse, the power to drive, loyalty is lifted out of the realm of

sentiment. It becomes more than the mere lip service of enthusiasm, for the completely loyal man works with all the resources of his whole soul, body, mind, heart and will for the achievement of the vision which has been given him.

Loyalty to things worth while is made up of three parts :

First—A definite thing worth while to be accomplished.

Second—An abiding assurance that our utmost satisfaction lies in the accomplishment of this definite thing.

Third—A persistent effort for its accomplishment.

Confidence begets loyalty, therefore, it is highly essential that employers should gain the confidence of their employees by demonstrating that it is the policy of the management to be absolutely fair and square in all of its dealings with employees. When employees are in trouble they should endeavor to find out what the trouble is and, if possible, relieve it. If there is a death in the family of an employee proffer assistance—do not wait for him to come to you. Let employees understand that if they need financial help for a worthy purpose, the employer is ready to furnish it. Such treatment cannot but inspire confidence in the employee that his employer is interested in him.

Make employees feel they are an actual part of the organization, not merely a pawn to be picked up and used when needed and then discarded ; that their standing in the social and business world depends on the way they discharge their duties. Give praise where due, and encourage them by calling their attention to those things which will aid them in their efforts to achieve success for themselves and their employer.

Improve working conditions and hours wherever possible. Provide a room for them with lockers for their clothing and equipment where they may warm and dry themselves on wet days. A company in the middle West furnishes hot coffee for its men, and this little favor is greatly appreciated by them.

In addition to a fair wage, adopt some system of reward. There are many plans of this character, several of which are given in detail in the chapter on "Bonus Plans" in the volume "Selling Ice."

A dealer in an eastern city relates an incident of loyalty which he considers one of the pleasantest things that ever occurred to him in his business life. "A foreman of mine had been

in my employ for a number of years, first as a laborer, then as a driver, then as a foreman. He had a little misunderstanding with my son, who is the manager, took offense at his ruling and handed in his resignation to take effect after a given number of days. I could not interfere because we must maintain our discipline. But before the time elapsed another son stopped at his house one evening and said: 'John, you gave in your notice to quit. Did you mean it?' After a moment's hesitation he said: 'No, I could work for your father in my bare feet. Forget it. I was in the wrong.' Now that is the kind of loyalty that counts, and the kind that makes good crews. That man is still in my employ, and I never knew for him the hours to be too long or the task too hard."

When employees have confidence in their employer they are loyal to his interests and it is not difficult to retain their services.

Confidence and loyalty are necessary for co-operation. Co-operation means harmony, and a harmonious organization means success.

**Methods That Have Accomplished Results.**—Very few human beings but what like commendation, whether it be from employer, customer or fellow worker. Most every one experiences pleasure when he knows the work he has to do is done in a manner that is satisfactory. To have his work commended increases his pleasure. When that commendation is expressed publicly the effect is multiplied many times. It not only increases the man's interest in his work, it gives him pride, and pride leads to loyalty. If a man has pride in anything he is loyal to it.

Owing to the seasonal nature of the ice business and the rapid increase and decrease in number of employees within a period of four or five months, and of the necessity of every one working during that period at the highest possible tension and long hours each day, very little attention, generally speaking, has been paid to creating a closer relationship between employer and employees.

However, several of the larger companies, particularly those handling other commodities in addition to ice, have given it considerable attention and have developed successful plans.

The Consumers Company, Chicago, has probably done as

much or more in this line than any other company. It engaged a man experienced in publicity work, and he worked in every department of the business, obtaining a working knowledge of the conditions and getting acquainted with the employees. As a result of his experience he advised the publication of a house organ. He was granted a small appropriation to try it out. The results were so satisfactory that the amount was increased until at the present time a handsomely printed publication of 32 pages, entitled "The Seal," which is the trademark of the company, is issued monthly. It contains articles each month from the officers and executives of the company written for the purpose of increasing interest and loyalty among the employees; special departments containing information relating to the work of the employees, commendatory letters from customers, to which is added a paragraph or so of how much the work that calls forth such letters is appreciated by the company. Portraits of the lowliest workers to the highest are published, together with personal items concerning them. Baseball teams, bowling clubs, etc., have been formed and their activities are reported in a special department.

Banquets for the employees of the various departments are given throughout the year. Another feature is an annual picnic, where all mingle, from the president down. Games of all kinds are held and prizes awarded the winners. Attendance at these picnics is very large. The family man takes every member of his family and his relatives. The single men, their sweethearts, sisters and other relatives. Tickets are free to all. It is doubtful if there is any better method of tying the employee to the company than such events, where everyone has an opportunity to meet everyone else and all have a good time.

Other features of the work of this company include the giving to each employee of an insurance policy, the premiums of which are paid by the company. It also maintains a pension list for old employees. The latest feature is the giving of \$50 in cash for each child born to an employee.

Another company has developed plans for forming a closer tie with its employees is the General Necessities Corporation of Detroit, of which David A. Brown is president. Most of the board of directors are employees. A co-operative purchasing association has been organized whereby the employees are able to

buy articles of all kinds at greatly reduced prices. A weekly house organ is published, and each issue contains a good editorial and personal news of the doings of the employees of the various stations. It also has an annual picnic for the employees.

It is doubtful if anything will encourage loyalty to the company among employees more than close intimacy with each other and with the officials. It breeds the spirit that each is interested in the other, and all are interested in the success of that which they are a component part.

Loyalty to the company will do much to correct many of the evils and abuses now practiced in the ice business.

**Enlisting Co-operation of Consumer.**—As an illustration of co-operation on the company's part to make the work of the employees easier, appreciation of the difficulties under which they work, and to improve the service to the customer, the following letter sent out by the Norman Milling and Grain Company, of Norman, Okla., is one that could be followed to good advantage by others:

Dear Mrs. Gossard:

Ice men are human—just like most everybody else.

That's why they can't always grin and be cheerful.

And it's also why I got up a few little talks to our wagon men—to try to make them feel as I do about the service an ice man should give.

These were prepared originally for the wagon man, to show just how we wanted him to handle his work and meet his customers. But later I wanted each of our customers to know what we do and how we really try to make our Norman Service the best in the state, so I had them printed into a booklet, a copy of which I am enclosing with this letter.

If you will, I shall be glad for you to read it over, as it will give you an idea of what we are trying to do, and maybe you can make some suggestions that will help in the work.

And I would like to repeat here my appreciation for the good things told me about our wagon men within the last few weeks. I have had the pleasure of having a number of customers call me just to praise some driver for being accommodating, and express their appreciation for his service—or sometimes to explain how he was trying to be fair both to the customers and to the company.

Of course I am pleased to hear these good reports and the wagon men are, too, because they are human just like you and I, and a little bit of praise often brings out the best there is in them.

I shall appreciate any suggestions that you may make as to our service, and shall be glad to know what you think of the wagon man who calls at your house—whether he is good, bad or indifferent, and whether you think he is trying to be what an ice man should be—courteous, prompt, careful and fair.

Yours very truly,

NORMAN MILLING AND GRAIN CO.

Accompanying this letter was an attractive twelve-page booklet, printed in colors, entitled: "For the Good of the Service. A little book of instruction to our ice men so you can see how we try to handle your business." On the last page was the following:

**Let This Be Our Creed for the Good of the Service This Year**

To promote the absolute confidence and good will of ALL our customers by meriting it.

To eliminate just complaints by removing every cause and to handle complaints that seem unjust in a way courteous and fair.

To remember that our personal likes, dislikes, or details of duty interest the customer very little—that good service is what counts.

To treat every customer the same or better than we would expect to be treated if our positions were reversed.

To do everything just a little better than we are expected to do—to make every customer feel that heaping measure of service, quality and quantity is given.

To be happy in our work because we do it well and to feel in our own hearts that we have played fair.

To be honest, cheerful, clean, fair, courteous, careful, prompt, polite and efficient in our daily duties. That's our ideal—it will make complaints impossible.

**Stimulating Co-operation of Customer.**—Those who have been fortunate enough to come in close contact with Mr. H. D. Norvell of the City Ice Delivery Co., Cleveland, Ohio, have long recognized the fact that he has given a great deal of painstaking and careful attention to the matter of instilling principles of honest conduct and ethical business principles in all employees, particularly those in the delivery department, while at the same time encouraging and stimulating enthusiastic co-operation on the part of the customers with whom the delivery men must deal. The following article is based on actual experience, while in some particulars presenting such humorous aspects, nevertheless it carries an undertone of deep significance both for the delivery man and the consumer of ice. It has long been recognized that both

of these must work together if the outcome is to be one of strictly honest business dealing in the delivery of the actual amount of ice paid for to all consumers. Every ice man will recognize in this article certain points that have undoubtedly come up at times in his own experience and the text may be read both with amusement and profit.

#### A Transaction in Ice

"Good morning ! How much shall I leave today?"

"Fifty pounds. You're a new man on this route, are you not?"

"Yes, I am a new man on this route, but I've been with the company for some time."

"What happened to Billie, the other man; has he been promoted?"

"No, I think not."

"What happened to him?"

"The company had to let Billie go. Coupon, please."

"Let me see, it was fifty pounds, wasn't it? Wait, I'll get the money."

"Money! What for?"

"Why, for the ice!"

"But I don't want money; I want a fifty-pound coupon."

"Yes, I know, but we always pay cash for our ice when we get it."

"Not to me—that's what happened to Billie."

"What?"

"Accepting money and keeping it."

"I supposed he turned his cash in, the same as the coupons."

"He couldn't turn in cash, and he knew it."

"Do you mean to say that Billie actually kept that money? I don't believe it! He was too nice a——"

"Madame, if he accepted cash he had to keep it; he couldn't turn it in to the company, for they wouldn't accept it and he knew it."

"Why wouldn't they accept money?"

"Simply because the rules of the company do not permit us to sell ice for cash."

"Well, that's the first time I ever heard of a company refusing to sell for cash. We always pay the money for our ice; we want to do it that way."

"Yes, many people do, for some reason."

"Well, I don't understand why we can't pay for our ice as we want to."

"I have our regular coupon books for sale."

"I don't want your old book! I haven't the price of a book handy this morning anyway."

"Well, I'll leave a credit book with you."

"Thank you, I don't need credit. Neither do I want your important collector coming around bothering me. Here's your money!"

"Lady, I can't accept your money."

"Now, tell me why."

"Well, first of all, because I have agreed not to; secondly, I don't want the temptation with me all day. If I take it, I know I must keep it; and if I'm found out, I'll lose my job."

"Well, don't keep it; hand it in to the company, and explain to them that I want to pay cash for my ice as I get it."

"Madam, the company can't have a rule for each individual customer; their orders are to sell no ice for cash."

"Well, that's the funniest thing I ever heard of. It's laughable."

"Yes, but the laugh would be on the company if they allowed their men to sell ice for cash without any check on the money."

"You don't mean to tell me that you drivers of ice wagons admit you are dishonest and that the company knows it."

"Honesty hasn't anything to do with it. You can just as well figure that we're all honest. The problem is, to continue honest; not alone for the love of honesty, but to keep one's job. The company realizes that to permit their drivers to accept cash for ice would be a careless method on their part and a temptation to their men; that no driver would be free from suspicion. Surely you'll admit that such a condition would be unfair to the men as a whole. Therefore, the company adopted the rule that no ice can be sold for cash in order to place their men above suspicion. It is not a question of honest motives; it is simply to eliminate dishonest practices."

"Young man, you are quite a glib talker and juggler of words; but you have not satisfactorily explained why I cannot pay cash for my ice."

"Well, would the statement 'Lead us not into temptation' help any?"

"You needn't be quite so smart."

"I'm not attempting to be smart at all. But why should you expect the ice company to conduct its business any differently from other concerns? Would it be fair to young men for the ice company to place them in a position whereby they were left in possession of the company's money during an entire day without any checking system by which they could prove to the complete satisfaction of the company the exact amount they had collected? Isn't it fair to assume that an honest man would insist that some system be found which would remove every cloud of suspicion? You don't go to the theater and pay a dollar to the man at the door and walk in, do you. No, you get in line at the box office and purchase your ticket according to the rules laid down by the management. In every department store your transactions are checked according to a system; even the smaller stores—yes, and the bartender's sales are checked up in plain sight of the purchaser by a mechanical apparatus called a cash register. On the modern street car, the conductor does not even touch your money; you deposit the fare yourself. Would you want your boy or



girl to be employed where money was left in their care without any check on it? Are clerks or salesmen permitted to make transactions freely, without any check on the money involved? Do the bankers trust you? Do you trust them? They keep a record and so do you. Why, even the books of your church are audited and checked up. The church committee insists that this be done for their own protection against suspicion. For the same reason the ice company adopted their rule in order to protect their men against suspicion."

"You don't seem to get my meaning; you haven't given me a good reason as yet why you cannot or should not take my money for ice."

"Well, if I knew exactly why you offered it, possibly I could give you a better reason for refusing it. But my first one should be sufficient—that is, that I have agreed not to do so. I have agreed to sell ice only by the company's regular system, for I believe they know what is best for all concerned—the customer, the employee and the company."

"No, you still haven't answered my question. The company has a check on your transactions, I insist on it. Don't they know how much ice you take away each morning? You must account for just that much when you turn in, must you not?"

"Yes, all but an amount they allow for shrinkage."

"Well, then, if you are short the fifty pounds you leave with me, can't you turn in the cash for it?"

"No, I can't."

"Why not?"

"Because they won't accept it."

"Well, that's strange. Why, do you suppose? It seems to me to be a real check."

"Well, it isn't. If the company had a means of knowing who the cash customers were and the number of pounds I sold to each, and they also had a means of knowing positively that no other customers on my route had been cheated through short weight, the system might work. But right there is where the temptation comes in. If I were to take your money I might want to keep it; and, in order to do that, it would mean that I must short-weight some other customers to make up the difference, and it's just possible that I'd 'clean' you for a few pounds, too."

"But you claim that the company makes you account for the ice you take on your load, less an amount for shrinkage."

"But, my good woman, if we were dealing in a commodity that was dealt out to us in sealed packages, it would be an easy matter; but we icemen are dealing in weight. We can, if the inducement is offered, short-weight each customer a trifle and sell the amount left over and pocket the money."

"Yes, but if you account to the company for all you receive, where does the company lose by the transaction?"

"That's simple enough. The company loses the customer I have cheated in order to give you fifty pounds and pocket your twenty-five cents."

"Do the customers know they are being cheated?"

"Possibly not, at first; but the greed for money takes hold of me and at each theft my power to resist becomes weaker; my will has lost power, and, as it weakens, the temptation grows stronger. Expensive habits must be satisfied and it isn't long until I have lost all sense of values and find it necessary to short-weight all my customers in order to satisfy my needs. Then, as I grow bolder, the customers complain. Finally, a few quit. Then the company puts an inspector on the job. I'm humiliated, lose my employment, get kicked out of the union, and, maybe, do thirty days in the works, and all because you won't play the game square. Now, let me answer your question the way you want it answered: Isn't it true that your reason for wanting me to sell you ice for cash is because you really expect me to give you a little more than fifty pounds just because you are making it possible for me to pocket the twenty-five cents? While we are at it, why not make a clean breast of it? Isn't it true that you imagine I am crook enough to welcome an opportunity to steal or have a rake-off in connection with my wages, and that you not being overly particular, expect thereby to get a little more by the transaction?"

"You have insulted me, and I'll not only report you to your company but I'll tell my husband, who will give you a sound thrashing."

"Oh, no he won't! Now, just be patient and hear me out. On this route there are about twenty customers such as you, and the company has trouble trying to keep men on the job. Many fine young fellows have been placed on this route, and each, in turn, has been induced to become a crook through the deviltry and temptation of these twenty customers. One of those poor devils has done work-house sentence on this account. And your husband won't thrash me at all, for I happen to be an inspector. Battling is a trifle that never worries me; but I have perhaps seemed a little harsh and abrupt. My tactics may appear to be those of a detective; but our only thought is to protect our men, to remove dishonest practices and make it possible for them to act right, and that is the safety valve of our moral nature. I don't believe you intended wrong, so let us be fair in the matter; the company wants your patronage; you need our goods; what do you say?"

"Sir! You have grossly insulted me! I am in the house alone and unprotected. You have taken advantage of me, and I shall demand an apology."

"To be fair, you must consider that my only intent was to right a wrong; to protect those boys who engage with us; to keep them clean; to make them the boys their mothers think they are.

Rude as I may have seemed, madam, the end justifies the means. When I tell you how these boys are tempted, you will readily understand why we must protect them. Do you know that a set of thugs, gamblers and crooks hang around our stations on pay days and inveigle our boys to all kinds of schemes, encouraging them to gamble, shoot craps. A dice game is the most popular now. This creates a temptation to sell ice for cash in order to get money to try their luck at gambling. How would you like to have it proved to you that you had fostered the spirit of theft and gambling by your method of paying cash for your ice? The company that you now feel so harshly toward really has a soul as far as taking care of its boys is concerned. You don't suppose the company cares less for its men than it does for its horses, do you? And you have evidence that it does take good care of its horses. Now, I'm going to leave the fifty pounds in your refrigerator, and say nothing more about the settlement. I want you to give this matter your best thought, and I am confident you will agree with me and admit that I am striving to accomplish a good. You have my word that no one, save yourself, will ever know of this incident through me."

"Oh, yes they will! My husband will know all about it tonight."

"Well, I must be going along now, else I'll be late. I'll be on this route for several days, as there are quite a number of irregularities to be looked into. Good morning, madam!"

The next morning the iceman appeared at the door, and, seeing only the maid, asked: "Where is the madam?"

"She is not to be disturbed this morning, bad luck to ye!"

"Do you want any ice today?"

"No, but we'll need some tomorrow, sure."

Promptly the next morning he appeared. "Good morning! How much?"

"Guess you'd better put in a hundred pounds, and all of it!"

"All right! May I see the lady this morning?"

"No, but the boss told me he wanted to see you; just wait a minute." She disappeared, and immediately Mr. ——— came into the kitchen.

"Are you the man who leaves ice here regularly?"

"No sir; I've been here only two or three times."

"Well, are you the fellow who criticised my wife a few days ago?"

"Guess I'm the man you're looking for."

"What do you mean by accusing my wife of attempting to bribe your men, or you, or someone else? Since when has your company been ordained, or designated, to set the standard of morals for the community? Why don't they drive around with gospel wagons, with one man to deliver the ice and another, like yourself, to preach from the tailboard? Let me tell you something: We are going to purchase our ice and pay for it as we see fit, and not to suit the fancy of some fanatical concern that is trying to combine evangelism and

commercialism. Don't ever attempt to dictate to me how I shall do my purchasing! The only reason we have not stopped taking ice from your company is because I wanted to meet you and tell you just what I think of your methods. I understand you are also boasting of your ability as a scrapper. Well, that's quite in line with the bullyragging manner in which you insulted my wife, when you knew she was alone and defenseless. Possibly you are a pugilist, and I may not be able to thrash you physically; but I am going to thrash you morally."

"Wait! I will endeavor to tell you what we are about. We are not preaching; we are attempting to practice. We are not attempting to dictate how you shall spend your money; but we have simply taken the pains to explain to you what the rules of our company are, and for our success in business we must adopt a system and insist that it be lived up to. It is your privilege to purchase your ice wherever you see fit; but if you buy from us, we must reserve the business right to say to you that we must have a certain method of payment and that rule must be followed. Surely, you wouldn't be unfair enough to construe that as a dictatorial policy."

"You can't evade the issue by any such nonsense as that. You are resorting to the old sympathetic strain; but it won't go down with me. You have attempted to play the bully with my wife, and you didn't get away with it. Now you are going to get the moral thrashing you deserve."

"Well, if you will agree to give me just what I deserve in every sense, I'm certain we can come to an understanding."

"It may be that your opinion of what you deserve and mine are very different."

"No, I don't believe there can be any difference, provided we go into the matter intelligently and with an open mind. But it is Saturday, one of my busiest days, and it's impossible for me to go into details with you; and, furthermore, you are quite naturally a little worked up over what you consider an unwarranted criticism of your wife, and, in fairness to both sides, I am going to ask a favor of you. Permit me to write you a letter, setting forth the company's side in this matter; and if I don't prove my case and justify my actions, I'll see that you get a season's supply of ice free of charge. What do you say?"

"I don't want any free ice; we are not objects of charity. You don't deserve any consideration from me; but I will, more from curiosity than any thought of your being able to show justification of your methods, agree to read your explanation. Have you been paid for the ice you left this morning?"

"No, neither do I want pay until after you have read my letter. Then, if I have not made a clean case; if I have been in the wrong, I promise both you and your wife an apology."

"Very well, but just leave my wife's name out of our controversy."

The next morning the driver again found the maid alone. "How much ice today?"

"Fifty pounds, bad luck to ye!"

"Now what's happened to you?"

"Faith, it's not what's happened to me but what may happen with the loikes o' ye spyin' around."

"My Lord! What have I done? I don't understand what you're driving at."

"Well, by the holy frosht! Would ye listen to him Ye don't understand? My, but ye're thick, aren't ye? Ye're as thick as yer ice and just as transparent; but it's me that can see through ye, although ye have the boss and the madam bunkoed wid yer lies."

"I don't get you at all; but anyway, the heat has you. What I'd advise is, that you sit on this ice for a while and cool off."

"Ye're cute and smart, aren't ye? The heat may have me, but I'll get over it in time, and I hope that whin ye die the weather'll be good and hot—so that ye won't notice the change. See if ye can get that through yer thick head."

"I get you. And if there's a nice cool spot down there I'll save it for you."

"Sure I have no hope of meeting ye there, for I imagine the divil himself often discovers people that even he doesn't care to associate with for very long."

"What's all this about? What have I done to you?"

"What have ye done? Oh, ye thraitor! Didn't ye have poor Billie bounced? You, wid yer sneakin', spyin' ways! What if he did get a few cents once in a while! It's little enough for the way he worked. The rich company never missed the little bit he got. What sort of a hypocrite are ye, anyway, to be runnin' around the counthry preachin' a docthrine that makes young men lose their jobs and go to jail? Is that the way to make better men?"

"But I don't understand why you blame me for all this."

"Well, upon my word! So ye don't understand, eh? Faith, then, if ignorance is bliss, ye ought to be happy for the rest o' yer life."

"I believe I understand you now. You imagine that I am to blame for Billie losing his job; is that it?"

"Well, now, isn't that wonderful! Sure it takes a lot o' switchin' to get some lads on the right thrack. For the love o' heaven, don't sthir! Ye've come to at last!"

"Well, now, you like Billie well enough to wish that he might be made a man of, don't you? And if I could prove to you that our doctrine, as you call it, would make a man of him, what would you say?"

"Faith, I'd say that hell is paved with a lot o' good intentions that have gone to the bad. Ye'd never make me understand any such docthrine as yours."

"But we must believe a thousand things that we don't understand. You are an intelligent girl, let me ask you a——"

"Here! Many a man has thripped over his good intentions. Whin ye're fishin' for compliments, be sure that ye can tell the difference between a nibble and a bite."

"Would you want to have Billie working for a company that forced temptations upon him every day—that threatened to make a thief of him?"

"Indade, I would not! If there's such a company in the world it's meself that thinks they ought to be suppressed. God knows, there are temptations enough without havin' jobs of work makin' more o' them!"

"Now we are beginning to understand each other. I knew I'd win out in the end. You can't keep a good man down."

"Faith, it seems not, for he'll rise in his own estimation, anyway."

"I'll pass the repartee, but listen! Did Billie ever tell you, or did you know, that when ever he took cash for ice that he was stealing that money, and——"

"What! Billie stealin'! Well, bad cess to the loikes o' ye——"

"Here! Wait a minute. Put down that broom and let me explain. Don't you know that the company won't permit its drivers to turn in cash? The rules are that ice must be paid for only by coupons; no man is allowed to sell for cash. Now then, Billie knew that rule, and when he accepted cash for ice, he knew that he was going to keep it, because he knew the company wouldn't permit him to turn it in to them. Don't you see now that, if we don't enforce that rule to the letter, we will be guilty of putting a premium on theft?"

"Mother of Light! I'm beginning to see! Faith, it's me that's been doin' harm to poor Billie without knowin' it. See now, 'twas all my fault. We should have taken the book whin he thried to insist upon it; but I don't loike to be bossed around, and it was me that told the lady not to take the book, rather than give in. All this time I was temptin' the poor boy, until now he's lost his job."

"I'm glad to know that you see the matter so clearly, and I'm going to promise you that Billie will have his old route back shortly."

"Ye'd better lave us a book, so that we can get started on the right road at once."

"Now I know Billie is going to be safe hereafter. Good-by!"

"He'll be safe with me, anyway."

The following is the letter that was sent and the answer received:

Dear Sir:

Availing myself of the opportunity given me by your spirit of fairness, in agreeing to read a written explanation of my company's

stand upon the question and policy of selling ice only in accordance with a set rule against cash sales, I beg to submit the following:

First of all, I am sorry our conversation of the other morning seemed to get into ethical lines. The subject is not one of ethics but of simple business efficiency. Our efforts are for the development of an organization of honest, faithful employees, working upon a plan of business which will win the good opinion and support of the customers we serve.

To accomplish that end, we try to keep the same men in our employ all the time. Only trained men can do our work well. It costs the company a great deal of money to train new men. The handling of ice is not so much a laborious work as it is one of skill and dexterity. Experienced men acquire the knack, and are, therefore, far more capable than untrained ones. And the training also teaches them to have respect for the thing they sell, because of its importance to the health and comfort of the community.

So we must do all we can to protect these men, upon whom we depend, from temptation and opportunities to do wrong. Sometimes an employee falls into petty wrongdoing without ever meaning to do so; and, by experience, we have learned that one thing which contributes to that is the payment of cash to the drivers who deliver ice. Your old driver, Billie, was one of these victims. He admitted to me personally that a few people on his route insisted on paying him cash, and he fell into playing little games of chance. Soon he was looking for more cash customers, and was eventually caught.

This man was not a bad man; he was just weak. But his case must show you how important it is for us to insist upon keeping temptation away from our employees. Our success depends upon the cleanness and reliability of our men.

I hope I have convinced you that there was no discourtesy in my refusal to accept cash at your home and that we may depend upon you, as a good citizen, to assist us in making our service valuable to you and to us.

Yours truly,

(Signed) John Doe.

#### THE ANSWER

Dear Sir:

I have your letter of recent date setting forth your contention for the sale of ice by ticket rather than for cash.

I am about convinced that you are right. At any rate, I believe in efficient organization, and you may depend upon my future co-operation.

Yours very truly,

(Signed) George Sterling.

**Heart-to-Heart Talks to Employees.**—The series of talks given to the delivery men by the manager of the Emporia Ice and Cold Storage Company, Emporia, Kan., were of such practical

value that they were published in a handsomely printed booklet as a book of instructions. The title of the booklet was "Talks to the Ice Men," and are reproduced herewith:

### TALKS TO THE ICE MEN

#### YOU MUST PLEASE THE PUBLIC

Our very existence depends on it. As soon as you leave the plant with your load of ice you represent the company. You are the company in the eyes of our customers. If you are courteous, honest and cleanly, they think of your company as being courteous, honest, and as running a sanitary plant. If you are impudent, slovenly in your work, or in any way unfair, our customers think of this company as being the same. The manager may be the one who signs your pay checks, but you cannot please him unless you please the public.

Of course, you will find a few persons whom no one can please, but this community has fewer such people than any city on record. Try just as hard to please such as to please your most reasonable customer. It may be possible to win their confidence, too.

#### PREVENT LAST YEAR'S COMPLAINTS

We had fewer complaints last year than ever before, because you gave better service. Make it still better this year. The main complaints last year were carelessness, discourteous treatment and short weight.

As to carelessness: Of course, you cannot stop to wash your shoes and wipe them with a cloth at each home, even if it is a muddy day, but you can show that you are trying to save the clean floor as much as possible. Mud tracks on a clean kitchen floor would provoke any saint. Suggest some convenient place for the ice box near the kitchen door or on the back porch. Be as neat as possible. We know that a few hours of perspiring and the drippings from the ice, mixed with the Kansas dust, will make a fresh laundered Palm Beach suit look like a coal heaver's worst. Yet "There is a difference." One woman begged us to change drivers because she had to air the kitchen each time to get out the tobacco smell. Why not leave the old pipe on the wagon seat, if you must have one with you?

Be careful how you handle the contents of the icebox. It were better for the customer to remove any breakable articles. Her touch is more gentle than yours. But if she leaves it to you—don't break or spill. It is hard to forgive either.

#### AS TO SHORT WEIGHTS

We do not think that we have a man who would intentionally shortweight a customer. If we did we would call him back in the middle of his run. However, such complaints are occasionally made



and we must meet them squarely. Each customer is entitled to every pound that she pays for and to know that she has it. Test your scales frequently. If anyone questions your weights, invite her to see the piece weighed. If she has scales of her own test them for her. And Be Courteous. Remember, every ice man is supposed to be a thief until he has proved his honesty.

Accuracy is the watchword. In taking out coupons tear off as near the actual weight as possible. Giving too much ice is as unfair as too little. They naturally expect as large a piece each time. Of course, you cannot always cut the ice just right. If it is a little short of weight—Tell Your Customer and then bring her a larger piece next time, and Draw Her Attention to That, Also. Educate each one as to the size a piece of ice of certain weight should be. Remember, it is our business to see that full weight is given. A satisfied customer is a booster for you and for us.

#### PROMPT DELIVERY WINS

We give each ice man a reasonable territory. Barring accidents, if he begins early in the morning and keeps going, he should reach all of his customers promptly. However, there is no time to visit. Most customers will recognize this, and you must. Good talkers draw much smaller salaries than good ice men. In the boxes yet to be filled milk and food are ready to spoil. Possibly some sick baby's mother is anxiously waiting for the rattle of your wagon.

We believe all ice men are human, and that when they have rushed from 5 o'clock in the morning to 5 in the afternoon, six days in the week, they are entitled to rest the remainder of the time, including Sundays. Explain this to your customers. They are reasonable. Ask them to call us before 4 o'clock if you have missed them. Call their attention to the hardship on yourself and team when they ask that you cover the same ground the second time unnecessarily. Often a customer would do without a second piece of ice if she realized what it cost the tired team and driver.

#### COURTESY ALWAYS

Remember this: Discourtesy, plus discourtesy, does not equal courtesy. This is not an algebraic equation, but simple business mathematics.

No matter how tired you are; no matter how much annoyance you have borne; no matter how much the extreme heat has worn on your tense and tired nerves; no matter how unreasonable a customer's demands may seem to you, Keep Smiling. Each housewife has her own troubles, and does not care to hear yours. Anyone can smile when everything goes lovely, but only a good ice man can smile every hot August afternoon. Remember what Sherman said about war? He never peddled ice. It is the ice man who can listen cour-

teously to what seems to him to be an unjust complaint that wins friends, and we cannot exist without hosts of friends. It is up to you to win them.

#### OUR CREED

To merit the good will and confidence of all by striving in every fair way to please.

To avoid all just complaints. To be thoughtful of each customer's needs; to be careful of her floor, her icebox and its contents.

To know that all get honest weights and to remember that they have a right to know it, too.

To be prompt to serve each patron and ready to explain anything about our system.

To be a good ice man always, which is courtesy itself. To be a friend to all.

The instructions given are so pertinent they are well worth emulating. They are an indication of the new, modern spirit that is reforming, inspiring and uplifting the ice business.

**Meetings of Employees.**—A method made use of by many companies to form a closer relationship between the employee and the company is periodical meetings. Some companies have annual meetings of all employees, with a banquet; others have weekly meetings of superintendents, monthly meetings of superintendents and foremen, and one or two meetings a year of all employees.

These meetings are the greatest medium not only of forming a closer relation between employer and employees themselves, but to educate them, to inculcate in them the principles of salesmanship, and create a spirit of loyalty and enthusiasm for the company.

Let the meetings be informal. Pass around cigars, make the men feel comfortable. You will get more out of men when they feel at ease. Where possible, have them seated at a table or desks where you can have them facing you, and provide a scratch pad and pencil for each one. It is also advisable to have a report of each meeting, copies given to those present and one copy kept in a binder.

Do not discuss too many subjects at one meeting. If too many subjects are discussed those present will become confused in their endeavor to absorb it all and in consequence they will not have a clear understanding of any subject. Do not make the meetings too long. Do not let their interest lag. If they do

not readily respond to a subject, call upon individuals for an expression of opinion. The remarks of one will set the others thinking and results will follow.

The General Ice Delivery Company of Detroit, in addition to hold meetings with its employees, pays all expenses of their executives and superintendents to attend ice men's conventions. One year they sent more than twenty of their men to Buffalo, N. Y., for three days. They consider the expense well repaid. The men not only have an enjoyable vacation trip, but they return better men, for the information they have obtained while at the convention is valuable to the men and to the company.

**The Company Convention.**—At a Board of Trade dinner in Franklin, Pa., W. O. Duntley, president of the Chicago Pneumatic Tool Company, Chicago, Ill., said: "The company or corporation that neglects to bring its men together at least once a year for social intercourse and an exchange of ideas as to the best method and means of doing their work is letting slip the greatest single factor in promoting harmony and efficiency among its employees known to modern industrial organizations. The annual get-together dinner of our corporation, when the men of the shops rub elbows with the officials of the company, makes them feel they are all members of one great industrial body, and it is invariably followed by a noticeable increase in the harmony and efficiency of our employees."

What the Chicago Pneumatic Tool Company has been doing with its hundreds of employees Fred W. Shafer of Franklin, Pa., has been doing in a smaller way with the most gratifying results. Mr. Shafer stated that they had drifted into the annual dinner idea by the merest accident, and their first experience revealed to them the immense possibilities of such an occasion, and it became a permanent feature of their business. The first two years the guests were confined to the delivery men and the affairs were purely social. At the second dinner it occurred to them that the annual events should be made to serve a double purpose. The social feature was worth all it cost in time and money and should be continued, but it was evident that another feature could be added that would give tone and character to the occasion.

Accordingly, they began to plan early that the third event

should assume the character and proportions of a small convention. There was an opportunity for educational work that must not be neglected. Up to that time, Mr. Shafer said, they had not heard of an ice company entertaining their men in such manner, and at the same time attempt to set before them the qualities that go to make an efficient delivery man. They had to blaze their own trail, and the whole plan was carefully worked out before the men had any knowledge of what was brewing. The men were greatly pleased when they were told the annual get-together occasion would assume the character of a convention and that the more experienced among them would be expected to read papers describing how they did their work to the best advantage and how they met and overcame the many annoyances and unreasonable demands made upon them by the thoughtless housewife. Several other questions were submitted for them to discuss, and they were informed that in justice to their customers as a whole, if there were courtesies shown to the delivery men mention of them must not be overlooked in their papers. The convention idea caught on and the men were eager for it, but preparing papers was new business to them and they needed a little coaching.

Mr. Shafer said that one of the best delivery men in their employ declared there was nothing to be written about the delivery of ice. It was only a matter of putting ice into the refrigerator of one customer and getting to the next one as quickly as possible. The route served by this man was in former years a constant source of trouble to the management, but in his hands there was no trouble whatever. He was modest, and not aware that he had done anything worth mentioning, and had to be drawn out by a few questions, which were submitted to him in writing. In answering the questions he made several suggestions that were of value to all of the men. He told them how he avoided controversies in regard to weights, in regard to the number of deliveries, and how he saved time.

Subjects were assigned to five delivery men—four responded. All of the papers dealt with the delivery of ice from the viewpoint of the ice man himself, and in order to make the program complete, a successful business man was invited to deliver an address on "The Delivery of Ice From the Customer's Viewpoint."

The convention was held on a Thursday afternoon, that being their lightest day. On Wednesday the public was notified there would be no ice delivered Thursday afternoon, as the ice men would meet in convention at that time. The dinner was served at 6:30 p. m., and a prominent ice man from an adjoining city was invited, and attended with four of his delivery men with him. Two or three merchants, one of whom was the heaviest consumer, were also invited.

At the conclusion of the dinner, the address referred to above was delivered and proved to be a heart-to-heart talk on the subject from a customer's viewpoint. The speaker's address in part was as follows:

In order to reach a full measure of success those intrusted with the management of the business and every employee must ever keep in mind that they are selling service and not merely some commodity. It is therefore your duty as delivery men to study carefully the details of your business, the product you are marketing, the delivery of it to your customers, and even its care and use after delivery. You are supposed to know more about the use of ice than your customers and they expect you to look after their interest in the matter of their refrigeration service. You delivery men come in direct contact with the customers of your company, and it all depends upon you whether these customers are pleased and satisfied or otherwise. Just stop for a moment and think of your responsibility. The business of your company is in your hands; if you are unfaithful to your trust and fail to properly perform your duties the business cannot prosper, for your company will lose the good will of its customers, without which no business can continue.

If I were in your place I would try to cultivate the friendship and good will of every customer and always appear before them with a pleasant smile and a friendly word. There are few people who will fail to respond to this, and you not only gain their good will for your company but for yourself, and you don't know when some of these customers may have something to offer to you which would be to your advantage.

I would endeavor to go about my work quietly, try to place the ice in its proper place and get away without having disturbed anybody or anything. You never know when unnecessary noises about a home may disturb some person who is ill, or perhaps in some cases awaken a baby, when the tired mother is trying to get an hour of rest.

I would keep myself and my clothing as neat and clean as possible; we expect cleanliness about our kitchen, why not about our refrigerator, where we keep the food we are to eat?

I would try to co-operate with each customer in keeping down waste. If I noticed a refrigerator placed where an unusual waste of ice would result I would call the customer's attention to the fact. He will appreciate these attentions.

It may, at times, be a little more trouble to do things in such a way as to secure the best results, but there is a great satisfaction in knowing that you have done the best you knew how. Success in life depends not so much on what things we do as it does on how well we do the things which our station in life places before us to be done. Your work, then, is not only of great importance to you and your company, but to the entire community; just as important as the work of any of us. You should so consider it and make a careful study of your duties that you may be able to reach perfection in your work.

The ice company is to be congratulated on having such a good crowd of men; men who have the intelligence to learn how their work should be done and the desire to do it right. I also think you are fortunate in having employment with a company which is so considerate of its employees. As a result of these conditions the public is benefited.

Mr. Shafer states that the suggestions of the speaker were timely, and improvement in their delivery service during the balance of the season clearly indicated that the men were endeavoring to measure up to the ideals he set before them. Their relations to the ice consuming public assumed a dignity heretofore unappreciated. A marked improvement was noticeable in the manner and appearance of the men, and complaints of a lack of courtesies became practically unknown.

Mr. Shafer says there is one feature of their organization that has gone so far in bettering their service to the public as the company convention. In giving their men higher ideals of service, it has benefited their customers, and in benefiting them it has given the company a larger claim on their consideration and patience.

## CHAPTER XII

### MISCELLANEOUS

**Ice Contests as Educational Factor.**—Improper cutting of ice and waste time in delivery is a factor in shrinkage. Many drivers have been handling an ice ax for years, yet do not know how to use one properly or to cut their ice to the best advantage. There is also much room for improvement in the delivery of the product, both in large and small amounts.

During the spring when business is not brisk why not have an occasional contest among the delivery men in cutting, weighing and delivering ice, awarding prizes of some character to the winners. The Massachusetts Ice Dealers' Association have had such contests on several of their annual outings. A feature of popular interest at the International Exposition of Refrigeration in Chicago in 1913 was the ice contest held nightly from Monday to Friday.

The contests were of ice wagon drivers and helpers for both artificial and natural ice. Fifty-seven contestants were entered from among employees of local ice companies.

**Drivers' Contests.**—Four ice boxes were placed at different points in the main arena of the exposition building. The boxes were equipped like ordinary family ice boxes and contained varieties of dishes, bottles, etc. The rules of the contest required cutting up of blocks of ice into 100-pound, 75-lb., 50-lb., and 25-lb. pieces, respectively, and delivering to boxes, first removing dishes, delivering the ice, placing box in good order. The

distance covered in making deliveries was 556 feet. The contest was judged on total time basis as follows:

1. Total time required to cut, weigh and make the four deliveries. Running disqualified the contestant.

2. For every pound short weight contestant was penalized 20 seconds. For every pound over weight, 10 seconds.

3. The breaking of any article in the ice box meant disqualification. The dropping of any article penalized contestant 10 seconds, as did the failure to replace any article.

4. Failure to carry ice on the shoulder meant a penalty of 20 seconds for each offense.

Contestants were required to be in regular uniform and pass inspection before entering contest. The prizes for the contest among manufactured ice wagon drivers consisted of a gold medal valued at \$75.00 as first prize; a \$50.00 silver medal as second prize, and a \$25.00 bronze medal as third prize. For natural ice wagon drivers a first and second prize of equal value was given. The time of the prize winners of the artificial ice helpers' contest was as follows:

First—Time, 5 minutes.

Second—Time, 5 minutes 18 seconds.

Third—Time, 6 minutes 14 seconds.

Time of winners handling natural ice under same conditions were as follows:

First—Time, 6 minutes 34 seconds.

Second—Time, 7 minutes 31 seconds.

**The Helpers' Contest.**—As soon as the drivers' test was run the helpers' trial began, being judged on same relative points as the drivers and with same penalties. The helper removed the ice from the boxes in rotation, placing contents of boxes in proper shape, returning each piece of ice to the judge's platform.

This contest was also conducted among both artificial and natural ice helpers. First, second and third prize medals were awarded in the artificial class and first and second prizes in the natural. The time of the prize winners of the artificial ice helpers' contest was as follows:

First—Time, 2 minutes 46 seconds.

Second—Time, 2 minutes 50 seconds.

Third—Time, 2 minutes 58 seconds.



The prize winners' time in the natural ice helpers' contest was as follows:

First—Time, 2 minutes 58 seconds.

Second—Time, 3 minutes 6 seconds.

The weight of the four deliveries of each contestant called for 250 pounds of ice or a total of 14,250 pounds for the fifty-seven contestants entered. The total actually delivered at the boxes was 14,420 pounds, being an overweight of 170 pounds.

The foregoing is given as suggestive of the nature of contest and time made by contestants. The following figures were obtained in a contest held by the Middle States Ice Producers' Exchange:

The loading of three tons of manufactured ice in blocks weighing 300 pounds each into a covered wagon; time contest. First, 4 minutes 58½ seconds; second, 5 minutes 40½ seconds.

The lifting of a block of manufactured ice weighing 150 pounds from the ground to the shoulder, carrying same 100 yards and return to starting point; time contest. First, 25 seconds; second, 35½ seconds.

The cutting of a block of manufactured ice weighing 300 pounds into twelve equal parts; uniformity of weight and neatness of cut and time to be considered. First, 28 3-5 seconds; second, 35½ seconds.

The cutting of a block of manufactured ice weighing 400 pounds into 40 equal parts, same conditions as for 300 cake. First, 2 minutes 14 seconds; second, 2 minutes 15 seconds.

Loading four tons of natural ice from car into open wagon—two men working together; time contest. Time, 10 minutes, 51½ seconds. Actual weight of ice handled 8,870 pounds.

Prizes consisted of nickel plated ice tongs and axes.

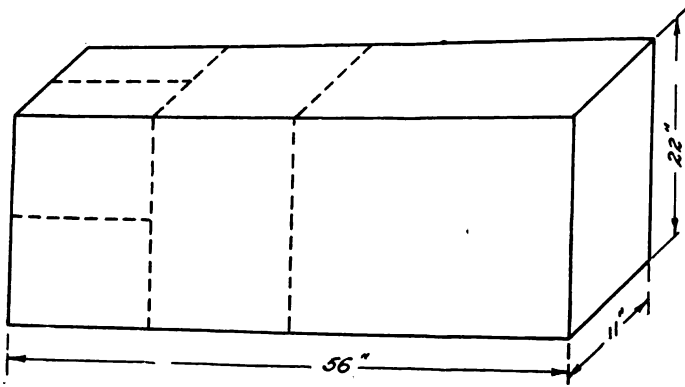
The following were taken from the program of another contest:

A credit of ten points was allowed in each contest, five points for speed, two points for ease or least effort, and three points for neatness and minimum waste.

To take five pieces of ice from ground without cutting, carry thirty feet and deposit on platform five feet from ground; pieces to weigh 100, 125, 150, 175 and 200 pounds respectively. First, 45 seconds; second, 1 minute 5 seconds.

To place 1,050 pounds of ice in a cooler or box 45x23x40 inches high inside, the bottom of the box to be five feet above ground, ice to be taken from wagon twenty-five feet away and weighed on wagon scale. Stepladder may be used. Two-man contest. First, 1 minute, 41½seconds; second, 2 minutes, 3 seconds; third, 2 minutes, 6 seconds.

**Cutting of Artificial Ice.**—The method of cutting artificial ice differs in different localities, and with different ice manufacturers. There are different sized blocks, to start with, as 100-



200-, 300-, and 400-pound blocks. The accompanying diagram shows by the dotted lines how a 400-pound block is cut up into various weights as follows:

- 11x22x56" equals over 400 pounds.
- 11x22x28" equals over 200 pounds.
- 11x22x14" equals over 100 pounds.
- 11x11x14" equals over 50 pounds.
- 11x5½x14" equals over 25 pounds.

The standard 400-pound cake of ice actually weighs about 416 pounds or more, the extra weight providing for loss by meltage, broken corners when cutting up, etc.

There are, of course, other ways of cutting this and the smaller blocks, but it is believed the above is the most common.

**Cutting Ice on Platform Before Loading.**—Several companies cut up the blocks of ice with power saws at the platform

before the wagons load. The following method is used by an ice delivery company in Pine Bluff, Ark.:

After the driver comes down in the morning and harnesses up his team, he next goes to the plant for his ice. He is given an order at the office for the amount of ice required and presents this order at the plant. The ice, before it is loaded in wagons and trucks, is cut up by a power-driven cut-off saw into 100-lb. cakes, and a part of these 100-lb. cakes are checked into 25- and 50-lb. pieces, according to the requirement of the trade. What is meant by checking is to run the saw over the ice and cut it a little over halfway through the cake, but still not break the cake in two, leaving it so that it can be handled as a 100-lb. cake. Then when a customer wants a 25-lb. piece it is only necessary to take a cake that had been checked in 25-lb. pieces and run a pick into the cut made by the saw and it immediately splits straight through into the correct size piece. The advantages of cutting ice by a power-driven saw are:

First. The ice is cut into nice, square-edged pieces; no ragged edges or pieces split off on account of not splitting straight. This feature is especially valuable when you have ice frozen at a very low temperature and is cracked, probably, while still in the can, or as soon as the hot water is run over it to loosen it from the can. The saw is set so that it will butt about three-quarters of an inch beyond the center of the cake, the balance of which splits straight the balance of the way when a splitter or pick is used.

Second. The second good feature about the system of cutting the ice into 100-lb. pieces before it leaves the factory is that it practically eliminates all chance of the driver cutting short-weight ice for his own personal benefit. When the ice is cut to 100-lb. pieces, and ice is sold only in 12½, 25, 50 and 100-lb. pieces, it is a hard matter to cut out a larger number of pieces than ought to be cut. However, it has been found that even with this system one of the drivers cut a few extra large 100-lb. cakes and checked them into fifties, and after getting out on the route, cut the large 50-lb. pieces into three pieces and sold them for 25-lb. pieces. A penalty of \$5.00, and instructions to the men at the plant to watch these large hundreds and have them checked into 25-lb. pieces before leaving the plant, stopped this practice at once.

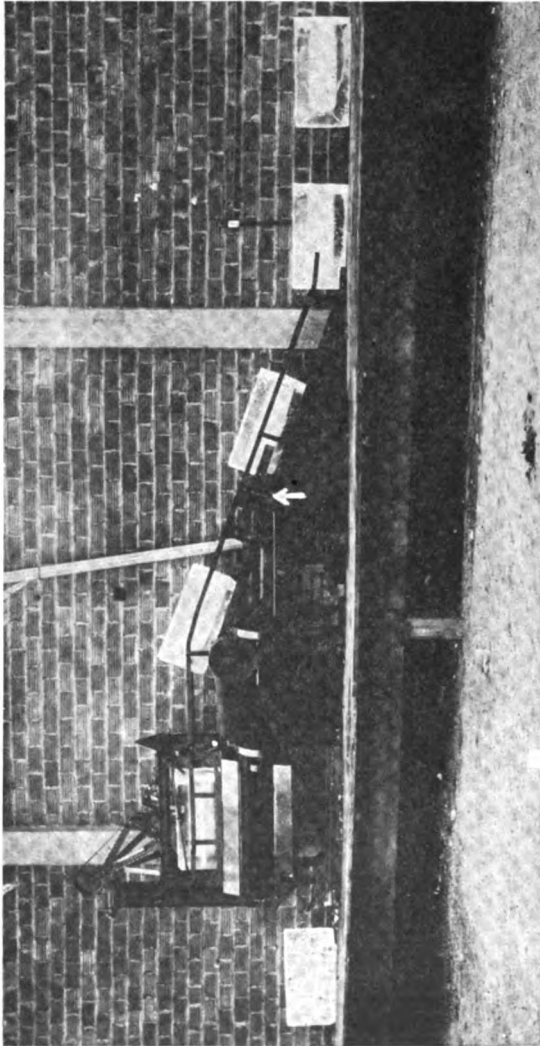


FIG. 61.—GENERAL VIEW OF ICE SCORING MACHINE

It may be argued by some that the cutting up of ice in the manner described before would cause a larger shrinkage than when left in whole blocks, and the customer would on that account be short-weighted. This would probably be true if large loads were permitted to be taken out, and on extra long hauls. On account of being centrally located, all routes being within easy access of the plants, drivers are not permitted to take out over 3,200 pounds on a load to residential sections, and when the ice is cut up and checked as described before, it does not take as much time to get rid of a load as it does when the ice goes out in whole blocks.

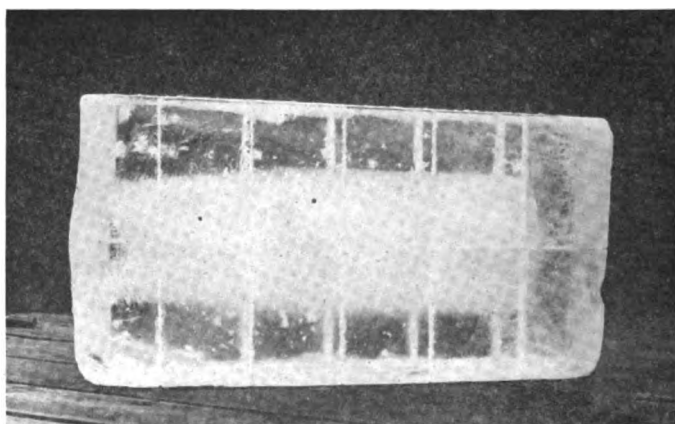


FIG. 62.—VIEW OF CAKE AFTER SCORING.

No shrinkage is allowed on wagons whatever. The men are instructed that if a piece should happen to shrink too much, it must be returned to the plant and fresh ice obtained in the place of it.

**Ice-Scoring Machine.**—A machine for scoring cakes of ice into twelve twenty-five pound pieces has been perfected by the M. J. Uline Co., Toledo, O. It would appear that such a machine solves the short-weight problem, or at least minimizes it very largely, inasmuch as any attempt on the part of the driver to cut the cake into other sizes would at once be apparent to the customer by reason of the saw curf. The operation of the Uline machine is very clearly shown in Fig. 61, wherein the cake of ice

is shown in its successive stages from the time it is placed in position to be picked up by conveyor until it is ejected from the machine fully scored. The cakes are scored at the rate of seventeen per minute.

The horizontal scoring of the cake is performed while the cake is on the incline at the point shown by the arrow, by passing between two disc saws which cut a groove on each side 2" deep by 3-32" wide. The cake then passes on to the cage shown at left of picture, which is an automatic lowering gig, and is

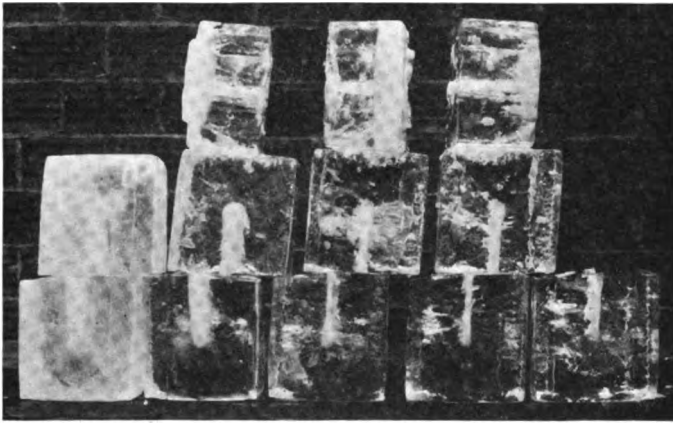


FIG. 63.—SHOWING CAKE CUT INTO 25-LB. PIECES

lowered through another set of saws which score it vertically to the same depth and width as the horizontal cut. After passing through the saws it is ejected from the machine scored into twenty-five pound pieces.

Fif. 62 shows a cake of ice after passing through the machine in which is shown the shadows of the saw cuts on the opposite side of the cake. While the picture shows a disparity in the size of the end pieces it is claimed that all are of equal weight.

Fig. 63 illustrates a 300-pound cake cut in twelve twenty-five pound pieces, which was done in ten seconds after cake was scored. Nine of the pieces are set up showing the wide side, and the three on top show the narrow side of the twenty-five pound pieces.

The machine is twenty inches wide and about twenty-six feet in length and can be installed on any loading platform by removing two planks and bolting it to cross beams. It is claimed

the machine needs no attention, is started and stopped by push button; is absolutely automatic and fool-proof. A five horse-power motor is required to operate it. The saws in the machine can be changed or taken out any way it is desired.

It is claimed that the scoring only takes one percent of the weight of the cake, but it is advisable to have the cakes five per cent overweight if twelve twenty-five pound pieces of exact weight are to be cut from a 300-pound cake. The machine will not cut twelve twenty-five pound pieces out of a cake that weighs only 290 pounds.

**Union Agreement.**—For purposes of comparison, and also to furnish some idea of an agreement between a labor organization composed of ice delivery men and the company, the agreement here reproduced is considered a fairly equitable one. It is in force in Dayton, O. A noticeable feature of it is that provision is made whereby the company is privileged to install a bonus or merit system, whereby an employee's wages can be governed by his ability and worth to the employer:

#### ARTICLES OF AGREEMENT.

This agreement, made and entered into by and between the Miami Ice Delivery Company of Dayton, Ohio, known as the employer, party of the first part, and Local No. 517, I. B. T. C. H. S. & H. of A., party of the second part.

#### ARTICLE I.

Party of the first part agrees to employ members of the I. B. T. C. H. S. & H. of A., Local 517, carrying the regular working card, on their wagons, trucks and in their stables, when in its power to do so, and in case the party of the first part hires any of the above men who do not belong to Local 517, said men shall become members within ten days after commencing work.

#### ARTICLE II.

All drivers and helpers on wagons, and drivers of motor vehicles shall receive \$33 per week. Stablemen who take supply loads and do any other work required of them in addition to their stable duties shall receive \$33 per week. Night stablemen, \$29 per week. Where there are less than twenty horses at any given location, \$31 per week for day work and \$27 for night work, seven days of eleven hours each to constitute a week's work for stablemen.

#### ARTICLE III.

It shall be the duty of all drivers, helpers and truck men to keep

horses and harness in good condition at all times, and to keep wagons properly greased and motor trucks properly taken care of, and all should be in a clean and orderly condition at all times. Sixty hours shall constitute a week's work for drivers, helpers and drivers of motor vehicles. Drivers and helpers working on regular ice wagons shall complete all work on their respective routes each day, regardless of the number of hours, not exceeding sixty hours per week. One hour shall be allowed drivers and helpers for noonday meal, unless otherwise agreed upon between the employer and employees. All time in excess of sixty hours per week to be paid for at the rate of straight time.

#### ARTICLE IV.

No ice shall be delivered from regular route wagons on Thanksgiving, Christmas or New Year's except when Christmas or New Year's occurs on a Saturday or Monday, and then one delivery shall be made. All other holiday and Sunday work to be paid for at the rate of straight time.

#### ARTICLE V.

Members of Local 517 agree to conform to all company rules and regulations governing employees, when such rules and regulations do not conflict with this agreement.

#### ARTICLE VI.

Any member receiving more than this scale of wages shall not suffer a reduction of wages on account of this agreement.

#### ARTICLE VII.

It is further agreed that a cause for immediate dismissal from the services of the company shall be intoxication, dishonesty, neglect of duty, use of vile or profane language or loitering.

#### ARTICLE VIII.

No member of this Union shall be discharged by the employer for refusing to deliver ice to any place with unsafe platforms or unsafe conditions.

#### ARTICLE IX.

Should any difference arise between the employer and Local 517 which cannot be adjusted between them, such difference shall be referred to a committee to consist of five members, two to be selected by the employer, two by Local 517, and the fifth to be selected by the four so named, all of whom shall constitute a committee to adjust such difference, and while pending before such committee for adjustment, there shall be no lock-out or strike, and the decision of the committee shall be final. Furthermore, there shall be no sympathetic strike with any other crafts during the life of this agreement.

#### ARTICLE X.

Thirty days' regular notice shall be given by either party prior



**ICE DELIVERY**

to the date of the expiration of the agreement in case of changes being desired. Otherwise same to remain in force and effect until a new agreement is made and signed by both parties.

**ARTICLE XI.**

Time shall commence fifteen minutes before wagons are weighed at the plants, where the teams are stabled on the premises. When in off of routes at noon, lunch time shall occupy a period of not over one hour, after which employes' time shall commence. All drivers and helpers shall have the privilege of punching a time clock. All drivers and helpers when feeding on their routes will take one hour for the noon hour.

**ARTICLE XII.**

It is agreed that at all times this Union is to have its members further the interests of the party of the first part.

**ARTICLE XIII.**

Party of the second part hereby agrees that all employees of party of the first part affected by this agreement shall wear, while on duty, a standard shirt and cap, selected by party of the first part, and a dark pair of trousers. Party of the first part agrees to purchase said shirts and caps at the lowest possible price, quality considered, and sell same to employees at actual cost, and on an equitable time basis for payment, as desired.

**ARTICLE XIV.**

Party of the first part hereby goes on record in favor of some bonus or merit system, whereby an employee's wages can be governed by his ability and by his worth to the employer. Party of the first part does not guarantee that such a plan will be put in operation, but demands that the party of the second part shall not interfere in any way with the operation of any such plan, which may be formulated, provided the wage scale as stipulated in this agreement shall be used as a minimum, and provided also that all other conditions as outlined in this agreement are carried out. Party of the second part hereby agrees that no objections or interference of this plan in any way will be made by them during the life of this agreement.

This agreement goes into full force and effect the first day of April, 1921, and will continue in full force and effect until the first day of March, 1922.

Signed and witnessed this 16th day of March, 1921.

**Book of Rules.**—Many companies in various lines of business publish a book of rules or instructions for their employees. The character of these publications varies. Some contain a chart of organization and the defined duties of each member, paragraphs general in nature and applicable to every employee from

the president down to the office boy. Other companies publish a book of rules or instructions for the guidance of the employee in his dealings with the customer. Companies that have such books speak very highly of the benefits derived from them in many ways.

A good idea is to follow the first plan. By the use of loose leaves with a binder it is possible to give to all only that portion of the whole which it is necessary they should have. This method will allow of corrections and additions at any time without the necessity of reprinting the entire book, and it therefore can be kept up-to-date at all times without much expense. Or a combination plan can be followed, by having loose leaf sheets type-written for the officers and executives, and the rules or instructions printed in a bound book.

The following rules and instructions adopted by a company which followed the last plan mentioned are offered as suggestive of the character of the subject matter for such a book.

**General Remarks.**—As an employee of a company dealing in one of the necessities of life, you owe a duty to the public, and it depends on how you perform that duty that the company is judged.

Ice is an absolute economic necessity at all seasons of the year. The health of the family, but more particularly the health of the babies and children, is dependent upon the ice man.

In dealing with the public, always bear in mind that the public does not consider you as an individual, but as a representative of the company, therefore your actions are the company's actions.

It is the consumer who makes the success of the company possible, therefore your actions are the company's actions.

All complaints, no matter how trivial or unjustifiable they may seem, must be courteously received.

One point in connection with complaints that must not be forgotten, is to listen attentively and respectfully to the complainants until they have finished. Never interrupt the speaker while making the complaint. You will then find adjustment much easier. Complaints may be classified into four classes, viz:

The consumer who may have a just cause for complaint.

The consumer who thinks he has a just cause for complaint.

The consumer who is irritable by nature and complains of everything.

The consumer who has, or thinks he has, a just complaint but does not report it to the office, simply discontinues and complains to his friends of the treatment received.

The just complaint is generally easily adjusted.

A respectful hearing with proper explanation usually satisfies the second class.

If a complaint from the irritable person is received courteously he is generally satisfied. He has relieved his mind.

The customer who simply discontinues without a complaint is usually the most difficult to handle. In most cases he has complained before, and it has either been discourteously received or neglected entirely. This class can do much to discredit the company among their friends. Therefore it should be the aim of all employees to minimize the possibilities for complaint by performing the duties of their positions in such a manner as to give entire satisfaction to all.

Every man is or should be interested in the future. The future is what we make it. It is the policy of this company to develop its organization from within, which offers to every employee an opportunity to grow.

It is more difficult to find men to fill openings than to find openings for men. There is always a need for men to fill the position higher up. It is up to the employee to fit himself for the position above him. The employee who is fitting himself for the position higher up need not fear being overlooked. Close application to the work in hand and ability to do more still force recognition.

You can help by observing to the letter our rules and regulations; by calling attention to anything that is irregular or harmful to the interests of the business; by remembering that you, in your contact with the public, are representing and indicating the policies of the company; by remembering your own success depends largely on your own efforts, time and thought directed to the interests of the Goodwill Ice Co.

Do not accept our employment or hope to continue with us unless you are willing and anxious to abide by our rules and regulations.

**Loyalty—Boost.** A good word spoken for the company and your co-workers will always help both yourself and us in the mind of the other fellow. Do not "knock" your company, either to fellow employees or particularly to outsiders. It is unfair and breaks down just what we are trying to build up.

Co-operation is where a man makes good, or falls down. If you can help, DO IT, even if it is not your own particular duty. Remember all the time that you are working for the Goodwill Ice Co., and in helping them you will help yourself.

To bring about the highest possible perfection in business, it is necessary for each person in that business, from the manager down, to be in sympathy with the movement so that he will look for the good points and not the objectionable in everything that is done.

Criticisms and suggestions regarding our methods and their im-

provement, when presented carefully and in writing, will always be appreciated and receive consideration.

Do not hesitate to make suggestions to better our service. We know you are interested if you offer suggestions that have your thought behind them.

**Betterment.** If during your service with us you have opportunity to better yourself, and after conference with the management you cannot be satisfied with us, bear in mind it is our policy to help an employee better himself elsewhere, if we cannot take care of him ourselves. We will make no attempt to hold a good man down.

Trust and confidence is placed in everyone connected with our organization. Guard this as you would your nearest and dearest relative, or your home, and you will be safe beyond criticism. Do not be careless in your observance of our rules and regulations, and absolutely avoid putting yourself in a position to be criticized, particularly when you are handling money or delivering ice.

Customers, and they alone, are the cause of your continued service with us—think of it when serving them.

Customers well pleased are the greatest advertising asset possible.

**Rules for Delivery Men.—*Courtesy—Habits.*** A clean, neat, delivery man is a credit to himself and the company and is appreciated by the customer.

In contact with customers, or others, bear in mind that courtesy is the mark of intelligence; answer all questions of customers and prospective customers in a courteous, intelligent and respectful manner, both as to ice and coal.

We expect our employees to be very particular as to personal neatness at all times. Clean shoes will gain the good will of the thrifty housewife, who appreciates a clean floor.

Drinking while on duty cannot be allowed nor is smoking during such time proper. An intemperate man is not a desirable man to be employed and cannot be retained for any length of time in the employ of the company.

***Equipment.***—Your harness and wagon should at all times be so clean as to attract the favorable comment of those who see them.

Drivers are responsible for the condition of their horses, harness and wagons, and helpers are subject to the instructions of drivers, when not inconsistent with these general regulations.

Teams are fed by barn employees, but the driver is responsible for their thorough grooming and harnessing in the morning; this must be done by the driver or his helper. Drivers are expected to have clean wagons. A careful inspection should be made before loading in the morning.

Before leaving station drivers are expected to see that they have all necessary tools, and that the tools are in good order. Superintendent

or foreman will furnish tools, and if any become defective will have them repaired or replaced at once.

*Driving.*—Treat your horses well; do not misuse them. Remember that the horse is a dumb beast, unable to resent ill usage, but amenable to kind treatment and deserving of your thoughtful care. When wagon is standing in street, seek shade when convenient, and always at feeding hour.

Keep a level head and your temper at all times, and bear in mind that profane and vulgar language cannot be tolerated.

Be over-careful in driving; run no risks that might in any way cause injury to pedestrians, automobiles or vehicles of any kind.

At crossings, or other places where police officers are on duty, obey promptly and fully the directions of the officer.

Be cautious when about to cross railroad or street car tracks. On streets where there are car tracks, keep to one side of street as far as possible. Use every effort not to hinder or block street cars. Never trespass upon the time and way of others.

If you are driving in the tracks in front of a street car, pull out the moment you hear the gong. Pull out before you hear the gong if you are aware of the car approaching behind you. In approaching crossings of street railway lines, bear in mind that the average motor-man runs his car at such places frequently at a reckless rate of speed, and be certain to have ample time before crossing the tracks. RUN NO RISKS! Never drive with one wheel in the outer street car track and the other wheel the full width of the wagon outside of the track, thus blocking the easy passage of other teams. We consider this unfair treatment of others.

*Accidents.*—Every accident, however slight, or of whatsoever kind, must be immediately reported to the main office.

In case of accidents to persons, animals, or vehicles, first see that those hurt are relieved and cared for as far as possible; then get names and addresses of all witnesses you can, regardless of whose side they favor; get their views when possible. Report accident to main office by telephone and upon return to station, make a full report to the superintendent giving all details and information you have secured.

In case of accident on route, disabling driver, helper, team or wagon for further delivery, go to the nearest telephone and report to the superintendent, or other person on duty at the station, and ask for instructions.

*Responsibility.*—You will appreciate the necessity the company is under of making you personally responsible for any damage occasioned by your carelessness. All damage to property, whether caused by accident or carelessness, must be reported immediately for investigation. The employee will very often fare better by reporting damage to property himself, than having a complaint made by the customer.

*Delivery.*—Service is the cornerstone of an efficient delivery depart-

ment. It is the duty of every employe to help make the service of this company the best attainable.

"Safety First" is a good maxim to apply to service. When in doubt as to customers' instructions or needs regarding ice, play safe by calling on them. DON'T THINK they have enough to last another day.

Drivers will arrange their routes to make their deliveries to the best possible advantage, consulting with, and following any special directions of their route foreman.

In loading wagons, a good driver will first see that the inside of his wagon is thoroughly clean, and will then exercise great care not to waste ice by useless cutting and trimming at the loading platform, and will see that the ice contains no dirt from the platform or elsewhere.

Drivers should commence delivery of ice on their routes as early in the morning as practical, and under no circumstances should commencement of delivery be delayed later than seven o'clock.

In delivering retail or family ice you will ascertain the amount needed, make the delivery, and collect a coupon for the proper amount.

Deliveries of smaller amounts than called for by the coupon must not be made, and when customers request smaller deliveries, call their attention to the coupon book containing coupons of the smaller class of deliveries they may desire.

Great care should be taken to cut ice to fit refrigerators and ice boxes. Be careful not to damage ice boxes and refrigerators.

Keep a watchful eye for window cards, so that no customer having one displayed shall have cause to complain of being passed without a delivery.

When customers are at all regular in taking ice it is very much better to make a daily call of inquiry than to depend upon a window card. Make the customer as little trouble as possible.

Use every effort to give your old customers such good service as to please them and thereby keep them, but at the same time be ever on the alert for new customers.

You should be so well informed as to the purity and merits of the ice you sell as to give intelligent answers to all inquiries.

While you are not expected to deliver ice to families without receiving a coupon at the time, yet in case of a real emergency we should not wish an old and regular customer to be left without ice because the coupon book happened to be mislaid, or the mistress of the house not at home, and upon such special emergency a delivery can be made, a receipt taken on form provided which shall be turned in with other receipts. Drivers will be charged with the ice if this is not done.

When parties who are not customers desire to purchase ice for cash, you must refuse to sell it, but offer to sell them a coupon book, explaining to them that any unused coupons will be redeemed upon presentation at the office of the company.

In taking on new customers always examine the ice box, and inform them of the coupon book best adapted to their use, and coupon

books must not be sold calling for deliveries larger than the ice box will conveniently hold.

The first inside page of all coupon books is a receipt, which when filled and signed is to be torn out and returned to the station clerk. This receipt must be carefully filled out, and the receipt signed (if possible) by the customer. In cases where it is impossible to obtain the signature of the person to whom the book is delivered, you will fill in the name and address of such customer, especially the address. Servants must not sign for coupon books in their own name under any circumstances.

Drivers should use every possible effort to increase the sales on their routes, retaining old customers by prompt and regular delivery, and gaining new ones by personal solicitation. Watch new buildings, residences, or flats, and endeavor to obtain the custom of those moving into them.

Drivers must report any customer moving, giving old address, and new one if possible. *Also report any customer quitting, giving the reason for doing so. This is very important.*

In delivering ice to wholesale customers, you will take a receipt from the customer for the amount delivered, and will leave with the customer a delivery slip showing such amount.

It is especially charged that just weight be given. When requested, it is your duty to weigh the ice, such weighing to be done in the presence of the customers or their representatives.

Drivers will be held strictly responsible for each and every delivery made from their wagons, whether by themselves or helpers, and shall see that receipts are correctly signed by the proper party. Make no C. O. D. deliveries unless you get the money.

Drivers will obtain from station clerk a full supply of the various coupon books, for which they will be required to sign a receipt, and for which they will be held responsible. Always carry a sufficient number of window cards.

*Before leaving scales, be sure to obtain all orders for delivery of ice on your route.*

Upon completion of the day's work, you will turn over to station clerk all unsold coupon books, and slips of all books sold and money received for same. Deposit all coupons, weight tickets and other receipts in envelope which shall also be turned in to the station clerk.

*Cash sales of ice are not permitted without authority from main office.*

**Care of Horses.—Lame Horses:** Horses becoming suddenly lame must be stopped "on the spot" and foot examined for nails or nail pricks. If a nail is found, promptly report to the station. If a horse calks himself report to the station immediately.

**Loss of or Loosened Shoes.**—Shoes which are lost or become very loose or bent by being caught in car tracks must be immediately replaced at the nearest shop, and report made to stable superintendent on day it occurs. Get receipted bill for amount paid.

*Colic.*—When a horse attempts to lie down in harness, or lags and presents unusual symptoms, the station should be promptly notified, when instructions will be given as to further action.

*Heat-Stroke (Sunstroke).*—During the summer months drivers must be on their guard for heat-strokes. When a horse begins to pant heavily and stops sweating he must be removed to a shady place and sponged or doused with cold water over the head and immediate report made to station.

*Azoturea (Spinal Meningitis).*—This disease occurs during the cold or cool months in horses that have been idle for a few days. It begins when from one-half to one mile from the stable. The horse will sweat without apparent cause, becomes lame in one hind leg suddenly, as if he had picked up a nail, or stiff in the hind quarters, and if not immediately stopped he will fall and be unable to regain his feet. When first noticed the horse must be unhitched, thoroughly blanketed, and gently led to the nearest stable. The stable superintendent must then be promptly notified.

*Watering Horses.*—Be very careful about watering when warm. Never allow a horse to drink large quantities at once. When driving they should be watered frequently, at least every hour. Always water before feeding if possible.

*Feeding Horses.*—Horses fed on the road must be driven carefully during the first hour after eating. When a horse refuses his food the barnman must be notified as soon as you reach the stable.

Whenever possible teams must be unhitched and fed in the barn. When it is not possible to feed in the barn always take feed with you in the morning and feed your team not earlier than 10:30 a. m. or later than 12 m. This rule must be strictly adhered to.

Allow ample time for feeding, and do not use horses until through feeding.

*Hitching.*—Driver and helper must not both leave team without hitching. See that you have proper hitching chains and use them. Run no risks whatever.

*Blankets.*—When weather is cold or stormy always blanket your team when stopping.

*Grooming, etc.*—Each night horses should be thoroughly groomed, and if anything is noticed wrong, such as loose shoes, sore shoulders, sore necks, lameness, collar hurting, leaving feed uneaten, or if harness needs repair, report to barnman.

*Note.*—Horses that show any unnatural or unusual symptoms during the day must be reported to the barnman on returning to stable. Under no circumstances must this rule be violated.

In case of doubt, never hesitate to use nearest telephone.

**Delivering Ice By Wind.**—The cheapest source of power on earth, when it can be practically applied, is wind. Wind pumps water from many country wells and for ages has pro-



pelled vessels over the seas, but its use to drive a car loaded with ice for delivery is unique. Yet that is what has been accomplished by an ice manufacturer of St. Petersburg, Fla. It so happens that the largest consumer of ice in that part of the state of Florida is the Hibbs Fish Company, which uses between ten and twenty-five tons of ice daily. The fish company's plant is located on the pier of the A. C. L. R. R. Line, about one-half mile from the ice factory of the Citizen's Ice and Cold Storage Company, located along the same railroad. In order to minimize delivery cost the ice company evolved the plan of utilizing the continual sea breeze for which Tampa Bay is noted for delivering ice to the fish company. A small platform car, with capacity for between seven and nine tons of ice was available. This was fitted with a large canvas sail and, by setting this to catch the breeze, the car, whether loaded or empty, is driven from the factory to the pier and back to the factory, at a good speed, or as the ice company puts it, "at an exhilarating pace." At the pier the fish company's platform is on a level with the car, and the tracks being directly alongside, it is a very simple matter to unload and deliver the ice at any desired point along the fish company's platform and into its packing or storage rooms. The sail and the wind serve to save a considerable portion of the transportation charges on the ice.

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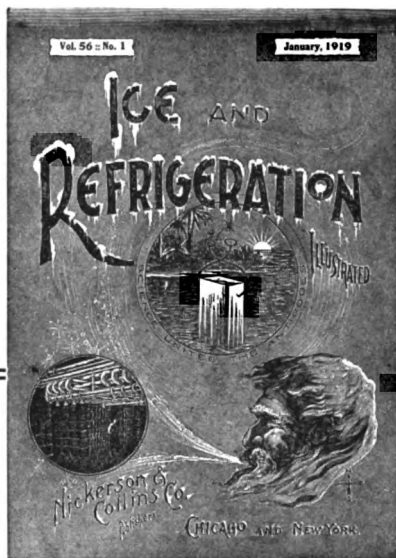
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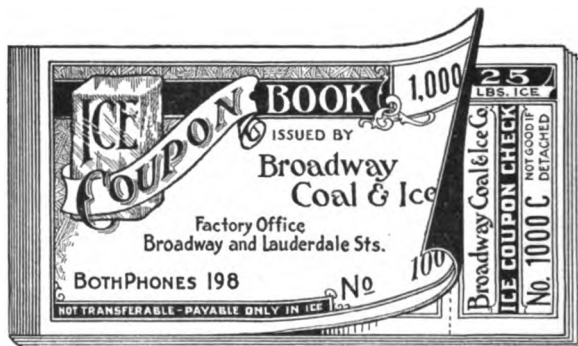


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